ESSAYS ON REGULATORY ECONOMICS: JAPANESE TELECOMMUNICATIONS

BY

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To

Masaru and Kimie

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The dissertation consists of three parts: I develop a framework for analyzing a regulatory regime, political exchange between a regulatory body and firms, and relationships between access pricing and welfare. Telecommunications is a good laboratory for applying the transaction-cost economics and politics. Chapter 2 and 3 identify institutional features of the Japanese regulatory regime, and contrast these with those in the U.S. regime. I present a conceptual model in which “Japan Inc.” is explained as a nexus of “informal relational contracts.” I also develop this model in the context of the telecommunications industry: recent deregulatory processes are explained as outcomes of a discretionary regulator’s rent-seeking behavior constrained by informal relational contracts.

Chapter 4 presents a two-stage model for political exchange in which both "complementary" and "substitutive" lobbying activity are addressed. The existence of a discretionary regulator distinguishes this model from other models that assume an idealized social planner. Substitutive equilibrium profit is higher than the complementary equilibrium profit. Equilibrium utility of the regulator always increases with an increase in the number of firms when

the number of firms is allowed to change. Then, the substitutive equilibrium automatically achieves the second best and brings higher welfare. Therefore, the existence of a network group of firms (resulting in substitutive lobbying activity) has both a positive and normative rationale under a powerful authority.

Chapter 5 examines optimal access pricing in a setting where downstream competition is unregulated but imperfect. I derive the basic principle that under certain conditions the less efficient the rival firm is, the less the regulator should subsidize its marginal cost of access. Comparing this principle with marginal-cost pricing for access, I find under marginal-cost pricing that a monopoly might be better than Cournot competition, and raising access charges for a less efficient firm may increase welfare. Then, the regulator needs to know basic demand and cost conditions to use even this simple rule appropriately. However, optimal access pricing guarantees that entry by a less efficient firm always increases welfare by excluding a significantly inefficient firm. Chapter 6 summarizes the relationship between the conceptual model and the analytical models.

CHAPTER 1
INTRODUCTION: METHODOLOGY AND OBJECTIVES

1.1 Regulatory Economics and Transaction-cost Economics

An incentive structure is an essential component of regulatory economics. Recently, it has been the central preoccupation of virtually all theoretical work on regulation. The theoretical work has contributed to economists' understanding of efficient public policy but it has had little influence on actual regulatory performance. We need a deeper understanding of fundamental institutional features of regulatory regimes.[1]

To understand this limited impact of academic regulatory economics, let me introduce a distinction between "**economic-incentive design**" and "**political-incentive design**." While economic-incentive design is managed by a regulatory body whose main (socially legitimate) goal is to improve market outcomes, the goal of political-incentive design is to improve actual regulatory processes affecting economic-incentive design. Then, the limited impact of theoretical research can be explained as follows: although economists contribute to our understanding of a variety of economic-incentive design issues under an idealized social planner, the technical analysis has had little influence in determining regulatory outcomes because the regulatory body does not behave as a social welfare-maximizing planner. Thus, economists need to analyze key positive aspects of actual regulatory procedures and promote the creation of new political incentive designs (which are compatible with economic-incentive design).

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[1] See Zajac (1995, p.4) and Laffont (1994, p.535). See also Kaserman, Mayo and Pacey (1993), and Faulhaber (1995) for telecommunications.

The transactions-cost approach can be a starting point for this exercise. According to Williamson (1989, p.142), **transaction-cost economics** (TCE) can be described in terms of three key features: (1) the degree and type of uncertainty facing decision-makers; (2) asset specificity characterizing investments, and (3) the frequency with which transactions recur. Many are skeptical of TCE because of excessive degrees of freedom and ambiguous definitions, yet some parts of TCE have been applied to game theory.[2] Since agency problems involving moral hazard and the costs of mitigating these informational asymmetries are major transaction costs, the application of TCE to game theory is a natural development.

For example, regulatory economics contains many examples of decision-making under uncertainty. In addition, it is widely recognized that the first best outcome is usually infeasible because of asymmetric information (reflecting transaction costs). Since TCE pairs the assumption of "bounded rationality" with "opportunism," all contracts within a feasible set are incomplete and economic agents will not necessarily fulfill their promises.[3] This situation generates the distinction between "feasible" and "infeasible" modes of contracting.

Secondly, trade (or transactions) frequency is used in a simple prisoners' dilemma game: infrequent transactions yield an inefficient outcome due to costly enforcement mechanisms which would be required for an efficient outcome. This result reflects the archetypal transaction with some elements of moral hazard, so it can be viewed as a typical example of transaction costs by Coase or Williamson.[4] However, we know that the existence of some institutional features may change these results: "repetition" allows for the possibility of self-enforcing "implicit contracts."[5]

---

[2] Williamson himself admits these points. See Williamson (1979, p.168) and Williamson (1989, p.136). Dixit (1996, p.31) also mentions how broadly the concept is interpreted.

[3] Williamson also uses the term of "a self-interest seeking attribute" that is variously described as opportunism, moral hazard, or agency problems. See Williamson (1989, p.139-40). See also Baron and Myerson (1982) for an example of regulation under asymmetric information.

[4] See Kreps (1986, p.232). See also Dixit (1996, p.71).

[5] See Kreps (1986, p.236).

In other words, we need not write down the terms of the contract, nor need we provide an enforcement mechanism for it. Similar results can be obtained if one party (who trades with a sequence of individual partners) carries a "reputation" from past behavior.

Thus, the transaction costs (stemming from the above mentioned type of uncertainty regarding credibility of commitments) can be reduced by the existence of repetition and reputation (that reflect the frequency with which the transactions recur). Baron (1996, p.403) uses **"relational contracts"** (the terminology developed by Williamson) to explain Japanese business practices. Since a relational contract is defined by an implicit understanding that continuation of the exchanges will result in future benefits, we can view it as an implicit contract based on some long-term relationships. As Baron (1996, p.403) mentions, such practices can be contrasted with these in the U.S. where most contracts involve the third-party enforcement through the courts: this provides the basis for organizing most exchange.

Finally, I can find an example of asset specificity relating to relational contracts. Unlike usual (or explicit) contracts, relational contracts are not necessarily made with a "formal" partner, or based on some laws or written rules. If an agent accumulates some asset to mediate between final traders, a trader may achieve almost the same results as a direct relational contract with another trader by using the agent as a mediator. I introduce these relational contracts as "**informal relational contracts,**" which play significant roles in the Japanese regulatory regime as I shall show later.

Three features characterize transactions and affect the actual distinction between feasible and infeasible modes of contracting. As has been noted, economic incentive design is not necessarily feasible under current political incentive design. In other words, transactions costs in the current regime are not adequately taken into consideration. Furthermore, several economic features of Japanese firms (as contrasted with the U.S. firms) have been analyzed by TCE. My basic idea is to apply a similar analysis to a regulatory regime incorporating features of the economy. For example, if a Japanese firm generally respects its reputation much more than an American firm, the regulator can use a different instrument to achieve the same goal. This study introduces the transaction-cost approach to the analysis for not only market economy but also political economy because both market and political institutional features determine the main properties and impacts of a regulatory regime.

1.2 Transaction-cost Politics (TCP)

In a so-called "mixed economy," a firm operates not only in an "**economic (or market) environment**" but also in a "**political environment**." The economic environment is characterized by the structure of markets and the patterns of competition among market participants, while the political environment is the legal, political, and social context in which corporate decision-making is embedded.[6] Just as "**economic (or market) exchange**" means that market participants trade their goods and services for money or other goods, "**political exchange**" implies that interest groups give their support in exchange for benefits. Their support takes the form of a vote, contributions to a political fund, or some political action favoring a candidate or party. Notice that interest groups include not only "private interest groups" (as firms, labor unions, and consumers) but also "regulatory officials" (as legislators, regulators and courts).

For regulated firms, political exchange with regulatory officials is as important as economic exchange with other firms. For example, when Washington began to request that Japan institute voluntary export restraints (VER), it became profitable for individual Japanese automakers to increase their quotas through political exchange.[7]

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[6] Baron (1996, p.xix). He uses a market environment and a non-market environment instead of an economic environment and a political environment. Dixit (1996, p.xv) also emphasizes that markets and governments are both facts of economic life.

[7] In fact, smaller Japanese automakers (as Subaru and Daihatsu) suffered because the Ministry of International Trade and Industry (MITI) did not assign them high enough quotas. See Ito (1992, p.371). See also Dixit (1996, Chapter 3).

Notice that this example also suggests that the pattern of political or economic exchange can be different across countries. For example, either politicians in Washington D. C. or the Big Three auto executives in Detroit will find some difficulty in implementing public policy such as VER. One can argue that there exists a unique Japanese-style economic exchange and political exchange, although the difference in style can be viewed as a matter of degree. Just as transaction costs in economic activity reflect a nation's institutional features in economic exchange, transaction costs in political activity depend on the fundamental features of political exchange.

Dixit (1996, pp.2-31) suggests a synthesis of the normative and positive approaches to policy analysis, labeled "**transaction-cost politics (TCP)**," which views policy making as a process in real time. Thus policy-making is constrained by a "feasible set," which takes transaction costs into account. His basic idea is that governments are imperfect systems (as are markets) because any political process should be viewed as a game between many participants (principals) who try to affect the actions of the immediate policy makers (agents). Since transaction costs are more pervasive in politics, and external enforcement mechanisms are less available, TCP can be a useful conceptual framework for analyzing national differences in the regulation of industries.[8]

Nevertheless, TCP (and TCE) cannot provide a single (unified) analytical framework: the contractual approach to the study of economic or political organizations (that TCE and TCP adopt) is "**path-dependent**."[9] Since every country has its peculiarities of history, geography, culture, population, language, and so on, approaches that recognize national differences differ in what characteristics they focus on. Thus, these approaches involve some vagueness in the concepts and conclusions, which may frustrate theorists. For example, Levy and Spiller (1994) shed some light on how country differences translate into differences in the operation of economic policy, but their answers are specific to the institutional context: there need be no one unique route to success in coping with transaction costs.[10]

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[8] Dixit (1996, p.35, pp.61-62). On bounded rationality and opportunism, Dixit (1996, pp.53-56) concludes: (1) political contracts are less complete than economic ones, and bounded rationality has more serious bite; (2) the political process cannot use monitoring and incentive contracts to the same extent that they are used in economic relationships.

[9] The idea of path-dependence suggests that history matters, and that small changes can have long-lasting effects. See Dexit (1996, p.28) for the further references.

However, since transaction costs (stemming from moral hazard and other factors) are more pervasive in politics, TCP (as well as TCE) can be translated into the language of game theory. One of the necessary conditions for careful application of the framework involves incorporating a small set of significant features that characterize political exchange into the analytical model. As Dixit (1996, p.35) mentions, TCP has some parallels with the concept of oligopoly. While there are so many different issues that arise in the study of inter-firm rivalry, there is little hope for constructing a single analytical model comparable to the elegant model of perfect competition. The same statement applies to TCP.

1.3 The Japanese Regulatory Regime and the Analytical Objectives

As Dixit (1996, p.82, pp.107-12) mentions, much of the research on TCP has been conducted in the U.S. The research reflecting some U.S. institutional features can contribute to improved economic and political incentive design. It is important for not only the U.S. but also other countries because an institutional feature is a relative concept and cross-national research serves as a good laboratory for applying the TCP conceptual framework.

My particular concern is with the Japanese regulatory regime, which sometimes seems quite different from the U.S. one. For example, Wolferen (1989, p.27) warns that foreign observers must always remind themselves that, with Japanese political life, things are rarely what they seem: while the Japanese constitution contains more explicit safeguards protecting citizens than those of Western Europe and the U.S, the bureaucrats of Japan's ministries make nearly all laws and (in practice) entrepreneurs do not (or cannot) take the bureaucrats to court. However, I can show that most of his examples (which he finds surprising) can be easily understood as natural outcomes of political and economic games.

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[10] See Chapter 3 in which I develop their conceptual framework.

One of my objectives is to derive an analytical model for economic and political incentive design that reflects essential features of the Japanese regulatory regime, using standard economic theory. To do so, I need to identify stylized facts of Japanese economic and political exchange compared with the U.S. exchange, and to analyze how these features play significant roles. I shall accomplish these tasks by building a conceptual model that characterizes Japanese political exchange and applying the model in a specific industry. Then, I shall transform part of the conceptual model into an analytical model based on standard economic theory.

My special concern is with the telecommunications industry because that industry is viewed as a strategic industry in Japan, as well as other counties. The development of the industry is supposed to be the key to creating a "**seamless multimedia network**." Since this network is expected to dramatically reduce transaction costs between traders (as well as meet other demands, including entertainment), it is viewed as one of the most important infrastructure industries for the nation's future. The multimedia technologies (that make it possible to provide voice, data, and video transmission at the same time) involve the integration of advanced hardware and software technologies in computer and information industries. The latter includes content origination, now provided by publishing, broadcasting, and motion-picture industries. In order to reduce transactions costs by using these multimedia technologies, accessing the multimedia will not depend on the location: the new information infrastructure will be based on a seamless network. In sum, the seamless multimedia network is supposed to reduce transaction costs by both lowering search costs and expanding the volume of high-quality information.

Whether current Japanese telecommunications policy is likely to create a ubiquitous multimedia network (that lowers transaction costs) mainly depends on the regulatory regime because the industry has been heavily regulated. Although several features of Japanese economic exchange have been analyzed and compared with the U.S, Japanese political exchange has not been thoroughly analyzed. When we neglect some features of political exchange, we are likely to misjudge actual functions of the regime: even though a country tries to imitate regulatory policy in another country, it may not work in the former country; a judgment based on only economic exchange mechanisms may be misleading. Therefore, I derive significant features of political exchange in the Japanese regime and presenting both conceptual and analytical models based on those features. To do so, the organization of the essays is as follows.

Chapter 2 identifies essential features of the Japanese political and economic institutions that contrast with the U.S. features, and explains most of them based on relational contracts: "**habatsu**" (faction), "**zoku**" (tribe), "**gyosei shido**" (informal administrative guidance), "**amakudari**" (the Japanese version of revolving-door practice), **industry associations** and so on. When these institutional features are closely related in a way that they enhance each other by their coexistence, I call the relationship "**institutional complementarity**."[11]

Chapter 3 presents a conceptual model for Japanese political exchange, in which the above mentioned institutional features are connected to one another and "**Japan Inc.**" (or the "**Iron Triangle**" among the bureaucrats, politicians and business men) is explained as a nexus of these informal relational contracts. Since a ministry or bureau uses "**shingikai**" (a deliberation council) in legislation and gyosei shido in implementation, it is a dominant player in the Japanese regulatory regime. However, it does not necessarily imply anticompetitive policies as long as power is constrained by the existence of horizontal competition among ministries as well as powerful habatsu or zoku politicians. The conceptual model also explains the recent phenomena and problems in the Japanese regulatory regime: an increase in relative power of the bureaucracy, which adds to the difficulty of achieving administrative reforms and reducing informal entry barriers.

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[11] See Aoki (1994a) for a formal analysis on institutional complementarity.

Furthermore, I develop the conceptual model in the context of the telecommunications industry. I explain recent deregulatory processes as outcomes of a discretionary regulator's rent-seeking behavior constrained by informal relational contracts. The first reform in telecommunications initiated by the cabinet can be viewed as a usual outcome of informal relational contracts. While the laws provide formal features of the regime, informal intervention controls entry and price competition. This situation is similar to other regulated industries. However, the political game between the regulator and regulated firms towards the second reform (which is supposed to emerge in 1997) is unusual in the sense that the reports by shingikai could not obtain a consensus among interest groups over several time periods. I explain these processes as an outcome of the regulator's unusual rent-seeking behavior, which is caused by the disappearance of powerful habatsu as well as recognition of new attractive rents.

The recognition of this powerful and discretionary authority shows some limitations of three views on Japan's telecommunications emerging from the literature on the U.S. The existence of the powerful and discretionary authority yields a serious problem: the better the economic-incentive design is, the more difficult it is to implement. Even though abuse of power by the bureaucrat results in an increase in relative power of politicians through a change of social norms, how to set access charges remains as a key issue from both political and economic aspects because it gives the regulator some regulatory control over entrants and competition. Therefore, in order to promote a ubiquitous multimedia network, we need to analyze a decision-making process of this discretionary regulator. Even though formal entry barriers are reduced, the discretionary regulator can still use access pricing for credible threat. Thus, we also need to analyze interconnection issues. The following two technical chapters present an analytical model for each issue.

Chapter 4 presents an analytical model of Japanese political exchange that is distinguished from other models in which a regulatory body is assumed to be an idealized social planner. My two-stage model supposes a regulator with an extraordinary degree of discretionary power, and addresses several characteristics of both "**complementary**" and "**substitutive**" lobbying activity to negotiate with her. While complementary lobbying activity reflects competitive behavior of firms for their interests, substitutive one reflects cooperative behavior. The model reflects several features of the Japanese regulatory regime and it shows that: (1) a substitutive lobbying firm can reduce its lobbying expenses more than those of a complementary or independent lobbying firm; (2) a substitutive lobbying firm's profit is always higher than the complementary one; (3) under the given number of firms, the regulator's utility in the complementary equilibrium is higher than that in the substitutive one, although her utility increases with the number of firms in both cases; (4) since the complementary equilibrium is likely to result in the too little or too much entry by firms, a social planner can achieve the second-best equilibrium by controlling the regulator's rent extraction; (5) on the other hand, the existence of substitutive lobbying activity automatically achieves the second best, which yields higher welfare.

Therefore, the model gives a positive and normative rationale for the existence of a cooperative network under a discretionary regulatory body. In other words, the existence of the discretionary regulatory body induces a network group of firms (as the Japanese industrial association), and they are institutional complements.

Chapter 5 derives the optimal access pricing design under restricted regulation with imperfect competition, and then compares the welfare index with that under marginal-cost pricing for access. My main findings under certain conditions are as follows: (1) the less efficient the rival firm is, the less the regulator should subsidize its marginal cost of access under the non-weighted social welfare maximization problem; (2) the optimal access charge decreases when the incumbent firm reduces its marginal cost in either the upstream or downstream segment; (3) this principle contrasts with marginal-cost pricing and the "**efficient compornent pricing rule (ECPR)**"; (4) both access charges can be equivalent only if certain cost and demand conditions are satisfied; (5) there exists a "U" shaped relationship between the cost differences and welfare; (6) then, under marginal-cost pricing, the following three scenarios are possible: entry by a slightly less efficient firm may increase social welfare; a monopoly might be better than Cournot competition; raising access charges for a significantly less efficient firm may increase welfare; (7) however, under optimal access pricing, allowing a less efficient firm to enter a monopolized segment always increases social welfare; (8) the difference is caused by an informed regulator who sets optimal access charges to exclude such an extraordinarily inefficient firm and to make final prices lower; (9) the more the market is large and the more the incumbent firm is efficient, the more inefficient rival firms can be allowed.

My findings (1) and (2) are similar to Lewis and Sappington (1995) while the observations (5) and (6) correspond to Lahiri and Ono (1988). In particular, the fact (6) explains not only the reason why Economides and White (1995) have the numerical examples in which a monopoly might be better, but also a possibility that raising marginal costs for a less efficient firm may increase social welfare. Then, the regulator needs to know basic demand and cost conditions to use this simple rule appropriately, although marinal-cost pricing (as a special case of the ECPR) looks to be simple and practical for a poorly informed regulator. However, the finding (7) suggests that optimal access pricing is designed to exclude this problem raised by Lahiri and Ono (1988). Under the optimal design, entry by a less efficient firm into a monopolized segment always increases social welfare.

Concluding observations are presented in chapter 6, which summarizes the relationship between the conceptual model and analytical models. Several directions for future research are also suggested.

CHAPTER 2

STYLIZED FEATURES OF THE JAPANESE INSTITUTIONAL STRUCTURE: A NEXUS OF RELATIONAL CONTRACTS

2.1 Introduction

This chapter identifies stylized features of the Japanese institutional structure. These features are contrasted with those in the U.S. I examine both economic and political environments on which the Japanese regulatory regime is based. Although much of the research on transaction-cost economics (TCE) and transaction-cost politics (TCP) has been conducted in the U.S, this chapter concludes that the Japanese institutional structure serves as a good laboratory for applying the transaction-cost conceptual framework.[1]

On the economic environment, several institutional features have been explained as a nexus of relational contracts among three entities: the Japanese firm; several aspects within the firm, relationships between the firms.[2] However, most of institutional features in the political environment still are viewed as somewhat exogenous, and many observers conclude that political exchange stems from cultural conditions within nations.[3] My basic idea is to explain both economic and political features based on **relational contracting**, which is defined in terms of an implicit understanding that continuation of the exchanges will result in future benefits.[4]

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[1] See Williamson (1989, p.142) for TCE and Dixit (1996, p.107) for TCP respectively. Dixit (1996, pp.2-31) suggests a synthesis of the normative and positive approaches to policy analysis, labeled TCP that views policy making as a process in real time.

[2] For example, see Aoki (1990), Aoki and Dore (1994), Aoki et al.(1994), and Tachibanaki (1996).

[3] See Murakami and Patrick (1988) and Wolferen (1989).

[4] Baron (1996, p.403). The terminology originally developed by Williamson (1975) explains Japanese business practices.

This chapter develops the concept of relational contracting to apply to political exchange. Since a relational contract is a kind of implicit contract based on long-term relationships, each partner to the transaction is not necessarily an agent who is subject to written rules or laws. In other words, relational contracts are not necessarily made with a formal representative based on written rules. An agent can accumulate human capital by mediating between final traders. Thus, a trader may achieve almost the same results as in the case of a direct "explicit" contract by developing a relational contract with the agent. I introduce these relational contracts as **informal relational contracts**, which characterize Japanese political exchange.

The plan for this chapter is as follows. To provide a general background, the following section summarizes major institutional changes in Japan, and shows that the basic political-incentive design of policy-making processes does not change so much.[5] The pervasiveness of informal relational contracts is also explained. Then, I consider several features of the Japanese economic and political environments from the relational contracting point of view: a nexus of relational contracts are extensive and hierarchical. In particular, in political exchange, informal relational contracts are pervasive and formal power is separate from actual power. These institutional features have their origins in the wartime economy rather than the native cultural tradition. The final section summarizes these institutional features.

2.2 General Background for Japanese Institutional Features

The first subsection briefly explains major institutional changes in Japan, and shows that the basic political-incentive design associated with policy-making processes has not changed much over time. The corresponding changes in the telecommunications industry are also summarized.

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[5] As the goal of "economic-incentive" design is to improve outcomes in economic exchange, we define "political-incentive design" by the policy-makers as seeking improvement in outcomes of political exchange through interest groups, including regulatory officials themselves.

The second subsection explains the concept of an (informal) relational contract in more detail. It also examines the reason why (informal) relational contracts are pervasive in Japan.

2.2.1 A Brief History of Constitutional Changes

There were two constitutional changes in modern Japan: (1) the Meiji Constitution in 1889 (that was a product of the Meiji Restoration in 1867); (2) the Showa Constitution in 1947 (that was a product of the conclusion of the Second World War in 1945). A **constitution** is often distinguished from a **policy action**, although the distinction is blurred in reality.[6] For example, Buchanan emphasizes the distinction between the constitution that governs the whole policy process and individual instances of policy-making within this constitutional framework. Since the distinction depends on what policy process we analyze, the concept is relative. I define a constitution as a set of rules that governs the whole policy process under my concern and a policy action as an individual rule in response to a specific occasion (within the constitution). Thus, two changes noted above are viewed as constitutional changes when we look at the whole policy process in Japan.

(1) The First Constitutional Change

Since the Meiji Restoration was originally caused by the western countries' threat associated with the resumption of overseas trade, the urgent and clear goals of the new leaders were to build up the nation's economic and military power in order to preserve independence. The initial goals were achieved via centralizing the government administrative power: within a couple of decades, the government replaced the old feudal system of the Edo era (1603-1868) with new institutions required for a modern nation.[7] Before the Meiji restoration, a decentralized (fief) system had been continued for more than 250 years: there were almost 300 fiefs where each feudal lord had the sovereign and collection-of-tax power. After abolishing the fief system, the new leaders appointed a governor of a prefecture, which became a modern unit of local administration. Most of these new leaders were from educated bureaucrats in the fief system, and these bureaucrats founded modern environments via centralizing the government administrative power.[8]

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[6] See Dixit (1996, p.13). Dixit names the outcome of any particular policy-making exercise "a policy act." Lucas also emphasizes the distinction between a policy regime and a policy action on a specific occasion within the regime.

In fact, the government imported political and economic environments as well as social norms from western countries. For example, the government sent talented people (including bureaucrats themselves) to western countries, invited foreign advisors, collected information, and adopted new institutions. These institutions included organizations within the government itself (like the cabinet system), a public school system, army and navy, and the promulgation of a constitution, which provided for independent legislative and judiciary branches.

The government also founded the economic environment: it gave farmers the right to buy and sell land, initiated state-operated railways as well as telephone and postal systems, and encouraged private enterprises (such as silk mills, a ship building yard and a steel mill) by setting up and managing model production facilities and by providing financial assistance. Later, the government also privatized these model production facilities.

Furthermore, in order to smoothly import such political and economic environments, the government enthusiastically adopted western culture (from hairstyle to clothes) in pursuit of so-called "cultural enlightenment."[9] In sum, the new bureaucrats built up the foundation for modernizing Japan (such as new social norms and modern political and economic endowments) by creating a powerful and centralized government. The new infrastructure contributed to Japan's transformation from a predominantly agricultural economy to a modern industrial power around the turn of the twentieth century. In these catching-up processes, it might save transaction costs for the government to collect the newest information in an aggressive and uniform way, spread it as a public good, and help modernize institutions.

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[7] It is well known that Japan already had suitable infrastructure for modernization (such as human capital to run and follow a bureaucratic system, skills for handicrafts, and nationwide commodity markets supported by land and sea routes). For economic background in both the Edo and Meiji era, see Ito (1992, Chapter 2) and the references.

[8] Most of them were lower or middle-class bureaucrats in Satsuma fief and Choshu fief, but even their feudal lords did not know that these bureaucrats would abolish the fief system.

(2) The Second Constitutional Change

The Second World War destroyed a fourth of Japan's national wealth and reduced production in the mining and manufacturing industries to one seventh of the level in 1941. Thus, Japan had to rebuild itself into a peaceful and democratic nation under the indirect rule of the **Allied Occupation Forces (AOF)**: a new constitution (forswearing war as a means of settling international disputes), three major economic reforms (including anti-trust measures, land reform, and labor democratization), the Dodge Plan (for controlling the three-digit inflation) and so on.[10] After Japan's sovereignty was restored in 1952, a high rate of growth was sustained for nearly 20 years until it experienced zero growth in 1974. Although there exist a long list of reasons for the Japanese economic miracle, sound policy decisions are usually included as one of these reasons.[11] As long as a ministry in Japan is a dominant player in such decision-making processes, the Japanese bureaucracy is an important factor within the Japanese institutional framework.

Interestingly, recent historical research shows that several wartime reforms (rather than the postwar reforms) contributed to the current environment: most importantly, the AOF left practically the entire bureaucracy intact.[12] If we recall that the Meiji bureaucrats founded the centralized government, we may be able to understand the reasons: (1) the bureaucracy had been enhanced to achieve a drastic economic change during the wartime; (2) the bureaucracy survived with little change during the postwar reforms; (3) the bureaucracy was a dominant player in negotiating with the AOF (for legislating and implementing the postwar reforms). In sum, the established bureaucracy again founded the current environment by expanding the role of the bureaucrats.

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[9] Interestingly, most of the government leaders initially refused to adopt western culture. After fighting against some western countries in the end of the Edo era, they recognized cultural enlightenment as a need, and so they supported adoption of the external culture.

[10] See Ito (1992, chapter 3) and Nakamura (1995, chapter 2) for the details.

[11] For example, see Ito (1992, p.63). However, Noguchi (1995, p.103-106,116) argues that industry policy did not contribute very much to the high rate of growth.

In other words, since the AOF renewed the Japanese environment by using the Japanese bureaucracy, the bureaucracy survived and flourished. Although the new constitution is a set of rules that governs the whole policy process, the bureaucracy itself is a dominant player. In this sense, the basic features of political-incentive design succeed those in the wartime economy, although many reforms based on the regime have been achieved.

(3) The Third Constitutional Change

Since fiscal reconstruction has been one of the most serious economic problems since 1974, we can view a recent series of administrative and economic reforms as an attempt to make a third major constitutional change. After the five-year economic plan in 1973, the government's forecast on economic growth (prepared by the Economic Planning Agency) consistently overestimated actual growth, and the shortfall of government revenue has been made up by bond issues and government borrowing.[13] Thus, the cabinet tackled the problem of fiscal reconstruction in 1981 by setting up **the Provisional Commission for Administrative Reforms** (Rinji Gyosei Chosakai), which was transformed into **the Provisional Committee on**

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[12] See Noguchi (1995, pp.76-84). See also Wolferen (1989, pp.349-349).

[13] See Ito (1992, p.66-67). Notice that the government's forecasts consistently had underestimated actual growth before 1974. See also Nakamura (1995, p.242-5) for fiscal reconstruction.

Administrative Reforms (Rinji Gyosei Kaikaku Suishin Shingilai).[14] Their reports lead to part-privatization and reorganization of telecommunications in 1985 and railways in 1987.

Thus, prime minister Nakasone (1982-87) himself compared the expected changes by his committees to the above two constitutional changes.[15] Recently, as **the Administrative Reform Committee** (Gyosei Kaikaku Iinkai) recommended more severe examination of administrative intervention into the market economy in December 1996, and some of entry and price regulations are expected to be abolished. As I shall show later, an essential administrative reform is still required for not only financial reconstruction but also industrial efficiency.

(4) Corresponding Changes in Telecommunications

Corresponding to these national changes, there are three constitutional changes within the telecommunications industry, which are examined in more detail in the next chapter. After the Meiji government founded telephone and telegram services in 1869, these services were supplied by the Ministry of Communications, which was the former organization of **the Ministry of Posts and Telecommunications (MPT)**. After the Second World War, **Nippon Telegraph and Telephone Public Corporation (NTTPC)** was created as a state-owned monopoly in domestic telecommunications service in 1952. **Kokusai Denshin Denwa Public Corporation (KDDPC)** was also created as a state-owned monopoly for international telecommunications service. Since most of specialists on telecommunications in the ministry moved to NTTPC, it is said that NTTPC had exerted more influence on telecommunication policy than the ministry.[16] Notice that NTTPC was already supposed to be privatized in the future at that time, which reflected the opinion of the AOF.[17] However, it took more than 30 years to make this change.

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[14] The first committee was set up in 1983, and the second one was in 1986. See Sezima, Ryuzo (1995), *Iku Sanga*, Tokyo, Sankei-shinbun, pp.362-463 for the details.

[15] Wolferen (1989, p.153) argues that it is exaggerated. For example, Japan National Railways Settlement Corp.(JNRSC) was founded to manage the debt of 25.5 trillion yen, but the debt in 1995 increased to 27 trillion yen. However, it must be an "attempt" to make the third institutional change.

[16] See Fujii(1996, p.6).

As one of the solutions for reconstructing finance, the final report in 1983 by the Provisional Commission for Administrative Reforms recommended splitting NTTPC (into a central company and some regional companies) and privatizing them. Then MPT drafted three new laws: **Nippon Telegraph and Telephone Corp. (NTT)** and **Kokusai Denshin Denwa (KDD)** were born as "**special companies**" in 1985, although the decision about the NTTPC breakup was postponed. A special company is a utility in the form of a corporation that is usually regulated based on a special law (like the NTT Law), which limits introduction of foreign ownership and prevents the companies from choosing their managerial plan and executives without approval by the regulatory body. This part-privatization is called **the first reform**, which is examined in the next chapter.

2.2.2 Informal Relational Contracts and Institutional Complementarity

Wolferen (1989. P.5) concludes that no one is ultimately in charge in Japan, although he mentions that the most powerful groups include certain ministry officials, some political cliques and clusters of bureaucrat-businessmen. Since he cannot find any supreme institution with ultimate policy-making jurisdiction, he calls the most powerful institution the "System." The "System" is the same as the state in the sense that it encompasses the entire body politic or the political life of a country, but it is different from the state in the sense that we cannot postulate accountability of the "System."[18]

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[17] See Kato (1996, pp.14-5). The opinion is natural because the AOF primarily consist of the U.S. military. In the U.S, private firms founded the industry in contrast with Japanese telecommunications.

[18] Wolferen (1989, p.43). The "System" is viewed as what it is by virtue of informal relations.

However, the "System" is too ambiguous for the application of standard economic theory. Wolferen (1989, p.47) mentions that Japanese industry is tightly controlled and obligatory conformity to unwritten rules limits policy-making options of individual members. He implicitly assumes that the "System" is self-enforcing. At the same time, Wolferen (1989, p.109) presumes that the highest goal of the top business belonging to a ruling (but not hereditary) class is to preserve the "System." Their incentives seem to be explained case by case rather in a uniform way.

In contrast with his approach, I view an institutional feature as a result of choices among rational individuals. As Baron (1996, p.403) mentions, a Japanese tradition has resulted in a system of organization based on long-term relationships made reliable by the anticipated mutual benefits from future exchange, which can be contrasted with the U.S. where most of contracts with the third-party enforcement through the courts provide the basis for organizing most exchange. The main reason why such **relational contracts** are pervasive in Japan but explicit contracts are dominant in the U.S. is **institutional complementarity**: institutional features enhance each other by their coexistence.[19] Although it implies that a nation's institutional feature is pass-dependent, it is not necessarily incompatible with the assumption in standard economic theory that an individual rationally behaves (even though the rationality is bounded).

Relational contracts can be enforced without the use of binding contracts. Long-term relationships (such as repetition and reputation) allow for the possibility of self-enforcing implicit contracts in the sense that each player is deterred from breaking the agreement by some credible threat.[20] Thus, coexistence of repetition and reputation are likely to enhance this threat.

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[19] See Aoki (1994a) for a formal analysis on institutional complementarity.

[20] See Kreps (1986) and Fudenberg and Tirole (1993, Section 5.3, 9). Although reputation effects do not necessary bring the same equilibrium as repetition, coexistence of both effects seem to be enhance credible threat.

For example, suppose that person A borrows $100 from her friend B but A does not return it. If B has some written documents, B can take A to court. If B does not bind any formal contract, B may give it up but never lend money to A. If other people in the small community believe B's story, A may no longer be able to borrow money, and may be even scorned. In other words, the community members play a role comparable to a court system. This example shows not only that social sanction deters players from breaking the agreement but also that a magnitude of sanction depends on institutional features.

As Baron (1996, p.375) suggests, Japan is relatively homogeneous: cultural homogeneous is a consequence of a variety of factors, including Japanese isolation in the Edo era, its resistance to immigration, the absence of fundamental religious differences, relatively small regional differences, a uniform national education system, and a national media. Thus, Japanese are likely to share similar value judgments, and divergent behavior causes serious social sanctions. Furthermore, a population-movement ratio in Japan seems to be relatively low. Then, the possibility of knowing or repeatedly meeting each other in the community is high. Historically, Japanese were prohibited from moving beyond their fief for more than 250 years in the Edo era. Even now, most Japanese graduates would like to return to their hometowns. Japanese workers are likely to stay with their firms because of the compensation system. These features contribute to credible threat against breaking relational contracts.

Relational contracts are often based on not only formal but also informal relationships, which again can be contrasted with typical American exchange that is based on both explicit contracts and formal relationships. In such an **informal relational contract**, the partner is not a legally responsible person based on formal or written rules.

For example, suppose that person A would like to negotiate with person B but each person belongs to a different community. Then, A may prefer an explicit contract to a relational contract. However, now assume that person C belongs to both communities. Then, relational contracts between A and C, as well as between C and B, may be possible if A can easily monitor the final result. Notice that the existence (and contribution) of person C is not necessarily based on formal or written rules.

In other words, a nexus of relational contracts can cover most of exchange by using a mediator, and the mediator can be viewed as a player who has human capital involving asset specificity. This human capital reduces transaction costs of final traders. Since political transaction cost are more pervasive, several institutional features for producing and supporting these informal mediators are built into the political environment including an industrial association, "gyosei shido," the "amakudari" system, "habatsu" and "zoku" and so on. These institutionally complementary features will be explained later. Although Wolferen (1980, pp.109-111) is surprised that top bureaucrats, politicians and businessmen are eager to build close "informal human networks" (such as school groupings and family groupings through marriage), these connections represent glue for a nexus of relational contracts based on informal relationships.

From the economic point of view, which contract is better depends on the efficiency for achieving some goal. For example, the Japanese judicial system may be more efficient for society if a low crime rate is the main goal.[21] The relative advantage of relational contracts over explicit contracts also depends on other institutional features determining sanction costs. We need to consider institutional complementarity.

2.3 Economic Environment and Origins of Regulatory Environment

This section describes the Japanese economic environment from the relational contracting point of view. As mentioned above, Aoki (1994a,b), Aoki and Dore (1994), Aoki, et al. (1994)

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[21] The statistics for murders and robberies per 100,000 people follows as: 1.5 and 1.8 in Japan and 7.9 and 205.4 in the U.S. Japan has one lawyer per 9294 people but the U.S. has one for 360. See Wolferen (1989, p.194,214). As he mentions that Japanese prosecutors have virtually

explain several features of the Japanese firm and the financial system by standard economic theory. We also need to pay attention to business organization as industrial associations and "Keidanren." Since a firm is a nexus of relational contracts, an economic organization and a relationship between organizations can also be viewed as a nexus of relational contracts.[22]

I show that a nexus of relational contracts are extensive and hierarchical in the economic environment. These institutionally complementary features have their origins in the wartime economy rather than the native cultural tradition.

2.3.1 Economic Environment

The most important feature of the Japanese economic environment is that a nexus of relational contracts is comprehensive and hierarchical. Their roles are significant from intra-firm activities to business-organization interactions. As examples at the intra-firm levels, the prominent Japanese firms are characterized by lifetime employment, a seniority-based wage system, and a company-specific labor union. A well known example of inter-firm levels is the "**keiretsu**," which is a business group of companies tied together by interlocking directories and mutual share-holding.

As Baron (1996, p.400) mentions, in contrast with the U.S. where corporations tend to have wholly-owned subsidiaries and cross-share holding of publicly traded companies is atypical, many of the most prominent Japanese firms are part of keiretsu: these create a network of firms that provides mutual benefits to its members. For example, there are six horizontal (or financial)

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unlimited discretion in deciding whether or not to prosecute, whether it is good or not is a different problem.

[22] See Aoki, Patrick and Sheard (1994), and Ramseyer (1994).

keiretsu. These bank-centered groups hold 24 percent of all the shares of the listed firms on the Tokyo and Osaka stock exchanges.[23]

The structure of these business groups is very complicated. The three largest keiretsu have succeeded the "zaibatsu" which before 1945 were family-controlled and were ordered to disband by the AOF: Mitsubishi, Mitsui and Sumitomo. Each group contains highly diversified industrial companies that are clustered around its own bank, real-estate agencies, insurance firms and trading companies. Although the Toyota Group and the NEC Group form their own vertical keiretsu, Toyota itself is also a member of the Mitsui Group and NEC is a member of the Sumitomo Group.[24]

In telecommunications, the relationship between NTT and a group of its suppliers has been so stable that the suppliers are referred to as the **NTT family**. NEC, Fujitsu and Hitachi, as well as Oki, are members of the NTT family. NTT has chosen inter-firm cooperation to a significant extent while AT&T (except for its NCR acquisition) has selected internal development.[25] Recall that the 1982 antitrust settlement lead to vertical divestiture from AT&T's regional operating companies. Then, in 1995, AT&T initiated on its own "trivestiture" breaking itself into three companies: AT&T, Lucent Technologies (providing communications products) and NCR Corp. (in the computer business). Thus, relational contracts are also pervasive in the telecommunications industry.

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[23] Baron (1996, p.400). They are often called "kigyo shudan": this literally means "firm groups." See Hoshi (1994, p.287).

[24] Vertical keiretsu consist of a prime manufacturing company and its numerous subcontractors, subsidiaries, and affiliates, linked by manufacturer-supplier business relations, stockholdings and personnel ties. For example, some 175 primary subcontractors are part of the Toyota group with substantial cross ownership, and some 4000 secondary subcontractors have looser affiliation. See Hsu (1994, p.199).

[25] See Fransman (1994, p.143). He also concludes that BT has opted for greater use of the market as a mode of acquiring network elements.

One explanation why many Japanese firms work in complicated network relationships is risk sharing based on relational contracts: Japanese group (keiretsu) firms have lower profitability but less variability of earnings than do independent firms that are not group members; the sensitivity of investment to internal funds is also much smaller for group firms because they face fewer information and incentive problems than independent firms.[26] Thus, relational contracts bring some anticipated mutual benefits from future exchange through risk sharing. In addition, these mitigate information and incentive problems in financial markets.

However, two-way moral hazard behavior may become a possibility in this locked-in situation characterized by mutual long-term association: a prime manufacturing firm may behave as a monopsonist while a subcontracting firm may behave as a monopolist.[27] In order to curtail such behavior, the so-called multi-vender system and partial ownership are commonly used. Although the prime manufacturing firm insures the subcontracting firm against income fluctuations through long-term contracts, the prime firm limits monopolistic behavior of the subcontracting firm by adopting multi-vender systems in which the same type of parts are supplied by multiple subcontracting firms. Cost sharing associated with prime-firm partial ownership of the subcontracting firm's equity limits monopsonistic behavior by the prime manufacturing firm.

The relative advantage of relational contracts over explicit contracts depends on not only the economic environment, but also political environment under given social norms. As Baron (1996, p.409) mentions, there are numerous and hierarchical **industry associations** in Japan, which address issues of industrial standards and provide information on foreign markets. The association also plays the role of increasing the sanction cost for a firm cheating on its implicit contracts. If a company cheats on its implicit contracts and other companies view it as breaking an important social norm, the company may lose its position in the association unless the company takes action to persuade others. Since associations are linked through a hierarchy network with a number of other associations, these sanctions imply that the company may lose most of the opportunities for its business.

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[26] See Baron (1996, p.404) and Hoshi (1994, pp.291-292). Note that incentive and informational problems end up increasing the cost of external funds.

[27] See Aoki (1994, p.19). In fact, NTT usually select more than two partners for a development a network element. See Fransman (1994) for a detail.

Actually, the network relationship is constructed comprehensively and hierarchically. The "**Keidanren (Federation of Economic Organizations)**" is the most powerful business organization, and it plays a significant role in both economic and political environments.[28] In 1991, Keidanren, the largest and most influential business federation, consisted of more than one hundred industrial associations including the automobile manufactures' association, the iron and steel federation, the chemical industry association, wholesalers, banks, insurance and securities companies, and trading companies. Notice that even a small firm is organized under another organization, the so-called "Nissho" (Japan Chamber of Commerce and Industry). These organizations represent the nation's business; they interact with politicians, bureaucrats and labor groups, and make policy recommendations. Thus, they also constitute the political environment.

Although the nexus of relational contracts are based on institutional complementarity, it does not necessarily mean that the market environment is anticompetitive. There exists severe competition among business groups, or among their prime manufacturing firms. There also exists hard competition among the subcontracting firms or among workers who entered the firm at the same time.

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[28] See Wolferen (1989, pp. 34-35, 353-357). See also Hsu (1994, pp.46-48) and Baron (1996, p.393).

2.3.2 Origins of Regulatory Environment

Much of the current Japanese system has its origins in the wartime economy. Examples include lifetime employment, seniority-based wages, and company-specific labor unions, regulatory administration through bureaus, the dominant role of indirect finance; centralized financial institutions, and weak landlord property rights.[29]

When Japan went to war with China in July 1937, the government had to change resource allocation drastically towards that of a planned economy.[30] Rigid government control continued for about ten years, until economic control was relaxed through the implementation of the Dodge Plan in 1949. As noted above, however, the basic structure formed for the wartime economy still survives.

Various rationing measures and price controls were introduced at the first stage of wartime resource mobilization. The Planning Agency (Kikakuin) was established in 1937 and the so-called **innovative bureaucrats** (who possessed strong anti-capitalist sentiments) advocated the idea of corporate control via managerial autonomy.[31] In response to an increase in strikes, the Industrial Patriotic Society (Sangyo Hokoku Kai) was founded in 1937. Its goal was to bind employers and employees more closely together.[32] Union membership rapidly rose from 8 percent of the workforce at its pre-war peak to 40 percent in 1938. This is the origin of the company-specific labor union.

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[29] See Noguchi (1995), Okazaki (1994), and Teranishi (1994).

[30] From 1937 to 1941, the share of machines was more than doubled from 14.4 percent to 30.2 percent while that of textiles more than halved from 29.3 percent to 14.7 percent. See Teranishi (1994, p.66).

[31] Planning Agency was commissioned to undertake investigations of the Soviet experience with a planned economy, and its journal contains numerous articles dealing with Soviet-related matters. See Okazaki (1994, p.363).

[32] This idea developed to the draft on a New Labor System in 1940: the firm should not be the property of the stockholders but rather, a communal organization composed of managers, engineers, office clerks and workers. See Okazaki (1994, p.369).

The National Mobilization Act (Kokka Sodoin Hou) in 1938 also shifted decision-making in favor of managers and workers by limiting the rights of stockholders and lowering the dividend propensity.[33] The law also spread lifetime employment and seniority-based wages through government wage controls.

Notice that pre-war Japanese firms and unions behaved more like classical capitalist firms.[34] Current features of the Japanese economic or market environment are products of the Second World War rather than native cultural tradition. The impacts of this period are pervasive throughout Japanese business and society.

The second stage after 1940 pushed the economy into a totalitarian planned economy: a control association (toseikai) was organized for each industry, and the allocation of resources was rigorously set by the Planning Agency and monitored by the control association. The aim of this "New Economic System" was to separate management from ownership in the firm (so that manager would be free of control from stockholders' pursuit of profit-making) and establish public-spirit orientation within the firm. Since the control association is a type of cartel that controls members of the industry in a form of "voluntary regulation," it is the origin of organizations to connect business with the government, including industry associations.

Because of the move to free the management of firms from influence of stockholders, the New Economic System had to be complementary to the "New Financial System." The National Financial Control Association (Zenkoku Kin'yu Toseikai) was formed in 1942, and it helped the banks to organize loan consortia under the guidance of the Bank of Japan (BOJ). At the same time, The Bank of Japan Law was amended to allow BOJ to obey national policy goals.[35] This mode of delegated monitoring was similar to that of the post-war “main bank system.”[36] After the number of the ordinary banks decreased from 466 in 1935 to 61 in 1945, the basic structure has not changed very much.

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[33] This made the role of indirect finance popular and it brought more controlled economy by the MOF rationing loans. See Hoshi (1994), Okazaki (1994),Teranishi (1994) and Noguchi (1995).

[34] Strictly speaking, zaibatsu-related firms changed a little bit earlier. See Hoshi (1994) and Noguchi (1995).

[35] Surprisingly, these first two articles do not change. See Noguchi (1995, p.3).

There is further history behind the formation of the powerful bureaucracy. The number of state enterprises called “**kokusaku gaisha (national policy firms)**” increased from 27 in 1937 to 154 in 1941; all were virtually under control of corresponding government bureaus.[37] The national policy firm is similar to a special company like NTT in the following manner: (1) they are joint stock companies; (2) however, some shares (e.g. more than half) are held by the government; (3) their executives and managerial plan cannot be chosen without government approval; (4) thus, their managers are often former public bureau employees. This is the reason why NTT is actually only a “quasi-private” firm and the first reform is called “part-privatization.”

Although it is said that the powerful Japanese bureaucracy dates to the Meiji Restoration in 1868 or even before, the above mentioned informal relationships between business and the government suggest that the current bureaucrat is a descendant of the war-period bureaucrat rather than the Meiji emperor bureaucrat.[38] The third constitutional change noted above is an attempt to reduce the negative impacts of this enhanced bureaucracy.

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[36] See Okazaki (1994, p.369). The Japanese main bank system is characterized as a nexus of relationships. See Aoki, Patrick and Sheard (1994, p.5).

[37] These firms shared 15.6 percent of total capital of the corporate sector. Most firms were investment or stockholding companies, and their rates of profits were quite low. See Teranishi (1994, p.63).

[38] Noguchi(1995, p.37). So he names the current system “the system in 1940.”

2.4 Political Environment

In contrast with economic exchange, the analysis of Japan's political exchange has not yet been based on standard economic theory.[39] However, since I find that relational contracts are pervasive in the economic environment, I derive features of the political environment from the same point of view: an individual in an organization and a relationship between the organizations in the political environment are viewed as a nexus of (informal) relational contracts.

This approach provides a simple and clear understanding of Japanese institutional features that often have been explained totally different from other countries. For example, Wolferen (1989, p.27) warns that, with Japanese political life, things are rarely what they seem: while the Japanese constitution contains more explicit safeguards protecting citizens than those of Western Europe and the U.S, the bureaucrats of Japan's ministries make nearly all laws and (in practice) entrepreneurs do not (or cannot) take the bureaucrats to court. He is also surprised at the Japanese proclivity to separate formal from factual power after examining historical episodes of kings without power. I shall show that most of his examples (which he finds surprising) can be easily understood as outcomes of informal relational contracts.

It is not surprising that a nexus of informal relational contracts are comprehensive and hierarchical in the political environment. The reason is simple: political transaction costs are more pervasive, and external enforcement mechanisms are less available. As Dexit (1996, p.56, 62) suggests, monitoring and incentive contracts can not be used in political processes to the same extent those in economic processes.

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[39] For example, Murakami and Patrick (1988, p.xvi) mention that Japan's economic performance and behavior over the long run can neither be explained by standard economic variables alone nor solely by political variables, and a broader interdisciplinary, analytical approach is needed to take into account social and cultural variables.

I explain several components of the political environment in order from the informal relational contracting view: " habatsu," "zoku," "gyosei-shido," "amakudari" and so on. Since these features are institutional complement, a nexus of informal relational contracts are pervasive in the political environment. The importance of informal relations sometimes causes the separation between formal and factual power.

2.4.1 "Zoku" Politician and "Habatsu"

A role of politicians is to mediate between interest groups. In Japan, however, the **Liberal Democratic Party (LDP)** has been controlling the Diet as the dominant party since 1955, and the politicians have been building their informal mediating mechanisms on which they are more heavily based than on their formal mechanisms.[40] This informal mechanism reduces political transaction costs for the LDP Diet members. The Lower House has 19 standing committees, and twelve of these committees correspond to the principal ministries (and agents). The Diet committees have relatively small staffs, and most of members are provided from the ministries themselves. Then, the LDP can make its policy based on an extensive internal decision-making process in the **Policy Affairs Research Committee (PARC)**, which has 15 policy sections whose policy jurisdictions correspond to the ministries and Diet committees.[41] As long as the LDP is a dominant party, an influential member in the PARC can decide policy direction because he is also an influential member in the corresponding Diet committee that always contacts with the corresponding ministry. Therefore, the LDP members are frequently concerned with a particular policy arena that yields attractive rents, and they try to extract these rents by mediating between private interest groups and the bureaucracy. These politicians are called "**zoku (tribes)**."

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[40] The LDP lost its majority in 1993 and fell from power in July 1993. Although it induced some members to found another conservative party, the LDP returns to power with the Social Democratic Party (former Socialist Party).

[41] See Baron (1996, chapter 13) for more detail. The lower house is powerful in the sense that it can elect the prime minister enact legislation by a two-third vote (even if the upper house disapproves it).

Since politicians have to compete to obtain a status as an influential zoku politician, they are likely to form "**habatsu (factions or political cliques)**." When we examine political competition among the LDP members, we can understand that habatsu is an unofficial group but it causes actual power. The prime minister in Japan has relatively few formal powers, but it is usually the ultimate goal for the LDP member to attain this office.[42] Thus, the LDP member has to gain a majority within the LDP. Several observations are in order: (1) the leader gives members political support to help with election campaigns and fund raising; (2) member support is used to promote the leader to prime minister; (3) the leader assigns cabinet posts and other positions to loyal supporters. Thus, habatsu is a kind of informal relational contract to bring mutual benefits in the long run.

There exist competition to get a better position within habatsu as well as competition among habatsu. Since the formal entry barriers facing potential political candidates are fairly minimal, it is important for a powerful politician to raise funds. Thus the LDP member is frequently concerned with a particular policy arena as a zoku politician.

The more influential zoku politician can attain membership in the larger faction. The member in the larger faction can be a more influential zoku politician. In other words, this informal mechanism is based on institutional complementarity, under which the larger faction can easily execute its power on policy making.

A typical example is former prime minister (1972-74), **Kakuei Tanaka**, who was also the leader of the largest faction as well as the boss of both the MPT and **the Ministry of Construction (MOC)** zoku politicians. It is now well known that MPT zoku can collect votes through small postal offices (as well as the largest labor union of NTT). These offices were originally organized by Tanaka, and most of influential zoku politician has been from Tanaka's faction.[43] The MOC uses a quarter of **"the second budget"**(the Fiscal Investment and Loan Plan that is financed from postal savings), and the minister is often called the "godfather" of some 350 constructors.[44] For example, per capita funding paid to Tanaka's hometown by the national budget in the mid-1980s was 60 percent above the national average. Thus, the MOC zoku gives some benefits to residents in their hometowns as well as to constructors, and receives their vote and fund.

This example suggests a feature of political exchange between a Diet member and a local politician. In contrast with the members of the U.S. congress, a Diet member is elected on the basis of highly personalized campaigns. Since the LDP has neither a well defined legislative program nor a grass-roots organization like those in the U.S, the members must rely on **"koenkai" (personal supporter organizations)**.[45] Thus, the centralized government system brings a division in politics: while the Diet member gives the local politician (in his hometown) political funds and subsidies, the local politician takes care of the koenkai and helps organize the Diet member's electoral campaign.

The example also illustrates the division between formal and factual political power. Since the minister of construction is an ideal position to attract political funds, the prime minister always tries to give the position to a member of his faction. However, in spite of the facts that Tanaka resigned as prime minister in 1974 over shady financial dealings and he also quit the LDP (but did not relinquish his Diet seat) following the Lockheed payoff scandal in 1978, he was

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[42] The prime minister does not have formal powers with regard to legislation such as the veto of the U.S. president. See also Baron (1996, p.379) and Wolferen (1989, p.32).

[43] Tanaka had been influential in this area since he brought up this system of small postal offices. The number of offices is over twenty thousands. Although the postmaster is a national servant, the position is actually hereditary. See Koizumi and Kajiwara (1994), *Yuseisho Kaitairon (Breaking up the MPT), Kobunsha*, Tokyo, pp.26-7.

[44] Wolferen (1989, pp.115-119,p.130).

[45] See Baron (1996, p.382) and Wolferen (1989. P.56, 229).

keeping more substantial power than sitting prime ministers. Tanaka could choose most members of cabinets in stead of the prime minister. The reason is simple: Tanaka increased his largest faction by 50 percent more until Takeshita (who also became prime minister from 1987 to 1989) succeeded him as the next faction leader in 1987.[46]

Furthermore, it is said that prime minister Ohira (1978-80), Suzuki (1980-82) and Nakasone (1982-87) would not have attained the post without Tanaka's support. After Takeshita succeeded Tanaka's faction in 1987 and quit prime minister (1987-89) following the Recruit scandal, the same thing as before happened by the same reason: no body could not attain the post without Takeshita's support. Again, Takeshita was more powerful than prime ministers including Uno (1989), Kaifu (1989-91) and Miyazawa (1991-93). Under this circumstance, informal relations with powerful politicians are highly important for the bureaucracy and businessmen, and they are often more important than formal relations.

2.4.2 Powerful Authority and "Gyosei-shido"

In 1992, the ministries had more than ten thousand cases for awarding licenses and other permits. **The Ministry of Transportation (MOT)** had the largest share (18.3 %), and **the Ministry of International Trade and Industry (MITI)** had the second largest share (17.9%). This formal regulation is generally based on the "**demand and supply adjustment clause**" in laws written (practically) by bureaucrats themselves. This provides the bureaucracy (as a regulatory body) an extraordinary degree of power on entry and price regulation. A typical example is that the MOT has been keeping "the same price in the same area" and almost never permitting entry without few exceptions. When a taxi company tried to reduce its price, the MOT disapproved the application. This company has been keeping a plan to entry the Tokyo distinction since its application was disapproved in 1985. It is supposed to be able to enter in 1997 because the cabinet gives MOT strong pressure to abolish the extraordinary degree of intervention.

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[46] Tanaka was found guilty in Lockheed scandal in 1983 and suffered a cerebral apoplexy stroke in 1985. Takeshita successfully held onto 80 percent of the members in Tanaka's faction. However, after Takeshita, the faction was split up and the LDP fell from power in 1993. See

Based on this extraordinary formal power, the ministries play a dominant role in the political endowment. Many examples support several reasons why the Japanese bureaucracy is a very powerful and discretionary player[47]: (1) bureaucrats, rather than politicians, write most laws; (2) the bureaucrats leave the wording of many laws purposely vague to be able to adjust the law to policy goals by newly interpreting it whenever law and bureaucratic policy appear to be conflict; (3) a ministry as a regulatory body formally has an extraordinary degree of power for awarding licenses and other permits as well as withholding (at their own discretion) advantages such as subsidies, taxes or low interest loans; (4) since the ministry uses "**shingikai (a deliberation council**, which will be explained in the next chapter), the Diet almost always is likely to rubber-stamps laws prepared by the bureaucracy; (5) since the ministry frequently use "gyosei shido" (informal administrative guidance) to implement its official policies, the weak economic judicial system formally cannot restrict the administrative power: firms do not take the ministry or bureaucrats to courts.

Therefore, the bureaucrats have an extraordinary degree of power: they do not only have more formal powers for awarding licenses, but also both write legislation and implement rules. They can also use their power at their discretion: they can interpret vaguely written laws and frequently use "**gyosei shido (informal administrative guidance).**" Gyosei shido refers to the suggestions or unwritten orders by Japanese bureaucrats to firms to implement official policies or

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Hayasaka, Shigezo (1995), *Kenryoku no Shisaitach (Priests for Power)*, Tokyo, Shueisha for Tanaka and the Tanaka faction.

[47] See Wolferen (1989, p.33,44,210,213) for these examples. See also Yayama, Taro, *Kanryo Bokokuron (The Bureaucracy Ruining the Nation)*, Tokyo, Shincho-bunko, 1996 for more examples..

to force them in their realm of endeavor to adopt "voluntary measures."[48] Therefore, the regulated firm is not likely to take the bureaucrats to court even though they sometimes have complaints. Besides, court proceedings require relatively large amounts of time and money, and effective power in the court system has been transferred to the General Secretariat as a part of the bureaucracy.[49]

It is well known that even the **Fair Trade Commission (FTC)** has the above mentioned power. Notice that the FTC is viewed as one of the most independent agency in Japan. The FTC enforces an Anti-Monopoly Law in Japan, but the FTC issues only a warning when it uncovers a violation. This administrative sanction is a mark of shame that both causes the practice to end and provides a deterrent to others.[50] It suggests that the FTC has some discretionary means of arranging punishments. In fact, there exist approximately 270 approved cartels for the purpose of rationalizing an industry by the appropriate ministry and FTC, but there do not exist any clear guidelines regarding when the resulting behavior might be considered problematic. Since losing reputation or breaking unwritten rules bring great social sanction or retaliation, most players do not run the risk of cheating.

Since the FTC is viewed as one of a powerless body, more powerful ministries use gyosei shido more frequently and they can more easily threat firms. For example, **the Ministry of Finance (MOF)** is known as the executor for "**the convoy system**," in which all incumbent (city) banks grew at about the same pace with sufficient rents by the rigid control over new entry.[51] The MITI is famous for the principal designer and executor for "**industrial policy**," but it also protects matured industries (in the same way as the MOT) under the name of industrial policy: the definition has never been clear. Industrial policy might best be defined as the policy the MITI designs and executes.[52] Thus, the basic behavior of the ministries is essentially similar, although the existence of international competition and the magnitude of regulated industry may affect how sophisticated their policy is. The ministry can use the extraordinary formal power at its discretionary through its gyosei shido (unwritten orders).

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[48] See Hsu (1994, p.1, 159) and Wolferen (1989, p.44). To do so, however, gyosei shido should be beneficial to the private organizations.

[49] Wolferen (1989, p.216).

[50] Fines are also used, but criminal charges are rare. See Baron (1996, p.386). Wolferen (1989, p.225) also mention that what keeps Japanese organization and their masters from sinning too much is the damage of their reputations.

[51] See Aoki et al.(1994, p.27, 30).

However, this does not necessarily mean the bureaucracy can be viewed as a dictator because of two facts: (1) since there exists severe competition among ministries for budget acquisition, each ministry demands some mediation by powerful politicians; (2) the ministry can share rents with regulated firms because of the existence of the firms. For example, with respect to the first fact, in the first half of the 1980s, several LDP politicians mediated the struggle between the MPT and MITI over the authority of the relatively new sector of telecommunications. With respect to the second fact, since firms have close informal relations with bureaucrats and want to maintain those relationships, they prefer implicit (compromise) solutions to formal judicial solutions. In fact, consumers sometimes take the bureaucracy to court because they do not have close informal relations with them.[53] If firms recognize that regulation severely reduces profitability, they may take the ministry to court. In fact, the above mentioned taxi company has taken the MOT to court. This legal action also imposes sanction costs on the ministry. Thus, both parties usually try to keep the informal relationship to create mutual benefits. This result arose from wartime government decisions, which favored production over consumption.

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[52] See Noguchi (1996). In fact, former MITI members survey many definitions of industrial policy and try to adopt a broader definition, which includes political fairness and social stability. See Goto and Irie (1994).

[53] Thus, the role of consumers as an interest group is relatively small. For example, see Wolferen (1989, p.52).

Therefore, gyosei shido can be viewed as informal relational contracts between regulated firms and the regulatory body. While the regulatory body usually protects the regulated firms from outsiders, the regulated firms give information and rents to the regulatory body.

2.4.3 "Amakudari" as Informal Links

Since relational contracts are based on long-term relationships, there exist some informal links. Zoku politician and the related organizations are formal and informal links between the bureaucracy and LDP politicians. There also exist informal links between the bureaucracy and business world. As the revolving-door practice in the U.S, the Japanese bureaucrats use "**the amakudari system**" to get their jobs in the business world. Unlike the U.S. bureaucracy but like the prominent Japanese firms, the Japanese bureaucracy is characterized by lifetime employment and a seniority-based on wage system.

The amakudari system is the post-retirement employment system of bureaucrats in an industry that they had worked closely during their government services.[54] For example, 60% of executives in "**special corporations**" in 1988 were former bureaucrats, who are called **amakudari**.[55] In the telecommunications industry, there were 52 former bureaucrats as executives of 33 companies in 1995.[56]

Notice that this is an "official" definition of amakudari based on the government report. Then, it is difficult to find amakudari from the **Ministry of Local Autonomy (MLA)** and **the Ministry of Education (MOE)** to private firms because these ministries regulate local governments and schools. Even though they get their jobs in local governments and universities, they are not officially counted as amakudari. However, unlike the U.S, the MLA plays significant roles in the centralized government system, and the MOE controls the whole education system in a uniform way.[57]

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[54] See Hsu (1994, p.10), and Wolferen (1989, Chapter 5). According to Aoki et al.(1994, pp.32-3), amakudari is different from the revolving-door practice in the U.S. in the sense that the job is arranged by the MOF, not by the individual concerned.

[55] See Baron (1996, p.385). Public enterprises except for departmental undertaking are called special corporations, which includes public corporations and special companies.

Thus, the standard leap is from the bureaucracy into business or politics while the reverse almost never happens unlike the U.S. For example, one-third of the LDP Diet members in 1994 are also former bureaucrats, but they are not counted as amakudari.[58] Thus, the former bureaucrats are active in both the business world and politics.

These former bureaucrats (including amakudari) work as mediators between their groups and their original ministries while accepting amakudari is part of costs for firms. The above mentioned industrial associations also work as this informal link between ministries and business. While the former bureaucrat always gathers information by informally contacting the former ministries, the regulated firm and the industry association (as well as the ministry) use this former bureaucrat as a mediator.

Thus, the basic feature of Japanese political exchange is that informal relational contracts are pervasive in the decision-making processes. In order to change public policy, a firm tries to either directly contact the ministry or indirectly negotiate with politicians. In the former case, the industrial association and amakudari members play significant roles in contacting the ministry. In the latter case, although the business world gives political support (in the form of political fund and vote to politicians), it chooses a politician who is actually influential on the ministry because the politician often negotiates with the ministry in an informal way. Therefore, it is important for both the ministry and the firm to make informal relational contracts with prominent habatsu and zoku politicians, and these contracts bring mutual benefit in the long run.

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[56] *Yomiuri Shinbun*, November 4, 1995.

[57] For example, Okimoto (1988, p.319) classifies the MLA into the second powerful groups, which follows the first group of the MITI and MOF.

2.5 Summary

I presented the essential features of the Japanese institutional structure as a nexus of relational contracts. A nexus of relational contracts is comprehensive and hierarchical in economic and political environments because of institutional complementarity. These institutional features have their origins in the wartime economy rather than the native cultural tradition.

These general differences between the U.S. and Japan ought to yield some differences in their regulatory regimes. However, it is also true that the difference changes with the industry and over time. For example, when we take a look at recent automobile industries, the difference of economic exchange may be viewed as a matter of degree. However, in political exchange, we find that informal relational contracts are pervasive. We can find the existence of gyosei shido, amakudari, the industrial associations and zoku politicians in almost all of the regulated industries, which is totally different from the U.S. regulatory regime. The existence of these institutions makes some specific policy (as industry policy) possible by lowering transaction costs. For example, even though the difference of economic exchange is a degree of matter, implementing VER seems difficult in Washington. VER is based on informal relational contracts in the sense that Washington requests the MITI to assign an implicit quota to each firm through the industrial association. Notice that the MITI does not have any legal right to do so. Since other regulated industries also have similar institutional features, most of the regulatory bodies can take this kind of policies.

Therefore, political exchange based on informal relational contracts distinguishes the Japanese regulatory regime from the U.S. regime. It implies that we should examine not only economic exchange but also political exchange to examine a regulatory regime in Japan. I shall attempt this task in the next chapter.

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[58] See Baron (1996, p.385). Businessmen run for an LDP seat less often than bureaucrats do. See Wolferen (1989, p.114).

CHAPTER 3
DEREGULATION IN JAPANESE TELECOMMUNICATIONS:RESULTS OF POWERFUL AND DISCRETIONARY AUTHORITY

3.1 Introduction

This chapter examines recent deregulatory processes in the Japanese telecommunications industry. As chapter 2 shows, Japanese political exchange can be totally different from the U.S. political exchange. Hence, the processes are examined in terms of both economic and political developments.

The objective of this chapter is twofold. The first task is to provide a conceptual model for Japanese political exchange in which central institutional features (identified in chapter 2) can be connected to one another. The second task is to explain the deregulatory processes by applying the conceptual model.

National cultural and political differences can cause different behavior of regulatory officials. Just as the U.S. telecommunications industry experienced two huge changes (the 1984 AT&T divestiture and the new 1996 telecommunications law), the Japanese telecommunications industry also faced two reforms. Note that **Nippon Telegraph and Telephone Public Corporation (NTTPC)** had been a state-owned monopoly in domestic telecommunications service since 1952, so reforms were potentially disruptive.

The first reform in 1985 is "part-privatization" of NTTPC. Since the first reform, there have been two main players in the telecommunications industry: **the Ministry of Posts and Telecommunications (MPT)**, the regulatory institution; **Nippon Telegraph and Telephone**

Corp. (NTT), the regulated giant with 93% of domestic calls.[1] Since they have been fighting the consequences of the second reform, the reform has been postponed three times: 1983, 1990 and 1996. After all, it results in the announcement by the MPT in the end of 1996: NTT will be restructured into one long-distance communications company and two regional communications companies, under a purely holding company. Although a purely holding company is illegal in Japan, most of Japanese conclude that this announcement foreshadows the second reform in 1997.

MPT's behavior towards the proposed NTT break up is different from the FCC's stance towards the ATT break up. While the MPT opposed the first reform in 1985, the MPT intended to break NTT up in 1990 and 1996. These facts contrast with the U.S. experience in which the Department of Justice filed an antitrust suit against the Bell System in 1974, but **the Federal Communication Commission (FCC)** initially disagreed with the AT&T break up.[2]

Two hypotheses that might explain the Japanese situation have very different implications for likely impacts on market performance: (1) the break up is beneficial to the MPT or (2) MPT's behavior is based on promotion of the public interest.[3] However, these are not necessarily incompatible because public interest ideologies can be viewed as representing another special interest capable of capturing the political process.[4] Thus, the general welfare may be perceived as reflecting a "special interest" to the extent that some stakeholders are left worse off after the change. Even though they may be uncompensated for their losses (despite an overall increase in real output), the "public interest" associated with the promotion of efficiency can be enhanced. If the MPT has different ideologies from the FCC or shares the same values of Judge Green, this might explain why MPT's behavior differs from the FCC. Since I consider such ideologies as social norms in my conceptual framework, I focus on hypothesis (1) in this paper.

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[1] MPT (1995, p.5). While the Telecommunications Bureau (as well as the Communications Policy Bureau) regulates the telecommunications industry, the MPT also has other bureaus. The Broadcasting Bureau regulates the broadcasting industry, The Postal Bureau oversees monopolized postal services by using twenty-thousand postal offices (which also contribute to postal savings and life insurance). Finally the Postal Savings Bureau and Postal Life Insurance oversee the largest bank and insurance organizations in Japan. The "MPT" does not write reports or make decisions: individuals do. Thus, the term MPT is used to reflect to the mix of bureaucrats, analysts, legislators, and regulatory officials that reach policy compromises that ultimately get reflected in (often ambiguous) MPT policy pronouncements. Agencies do not develop policies, people do.

[2] Kojyo and Nambu (1993, p.43) and Kato (1996, p.155).

[3] MPT (1996a) mentions that NTT still enjoys a de facto monopoly over local telecommunications networks and has increased rates. Faulhaber (1995, p.278) suggests that the Modified Final Judgment (MFJ) may be viewed as the driver of public institutional change moving the U.S. from regulated monopoly to a competitive regime.

Therefore, I present and examine "**MPT's rent-seeking hypothesis**", which consists of two parts: (1) the first reform initiated by the cabinet gave an opportunity for the MPT to recognize benefits produced from a typical Japanese regulatory regime, which has been formed by more powerful ministries as the **Ministry of Finance (MOF)** and the **Ministry of International Trade and Industry (MITI)**; (2) the current second reform advocated by the MPT tends to increase its benefits based on the recognition of this rent-seeking process. While this view is consistant with the fact that MPT frowns on privatizing postal services and savings (which is no longer defensible on economic efficiency grounds), my analysis yields different implications compared with those emerging from the literature on the U.S.

The plan for the chapter is as follows. The next section extends the conceptual framework proposed by Levy and Spiller (1994) so that I can examine both economic (market) and political environments. I also present a conceptual model for Japanese political exchange in which a famous label of "**Japan Inc.**" (or the "**Iron Triangle**" among the bureaucracy, politicians and business world) is addressed as a nexus of relational contracts. Recent changes of the triangle are also examined. Then, I summarize the current regime in Japan's telecommunications and the recent deregulatory processes as outcomes of a political game among interest groups. Section 4 presents the MPT's rent-seeking hypothesis to give more clear explanation for those processes including a recent agreement between the MPY and NTT in December 1996. The existence of rent-seeking behavior of powerful and discretionary authority yields different implications compared with those emerging from the literature on the U.S. The final section presents concluding observations.

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[4] See Kalt and Zupan (1984, p.281). They define political ideologies as statements about how government can best serve their proponents' conceptions of the public interest. See also Kalt and Zupan (1990). Furthermore, Keeler (1984) concludes that neither public-interest theories nor special-interest theories provide a complete explanation of the regulatory policies toward three industries: telecommunications, airlines and railroads. See also Becker (1983, p.372) who observes that morality is included in pressure by political groups.

3.2 The Iron Triangle as a nexus of informal Relational Contracts

This section proposes a conceptual model for Japanese political exchange in which several institutional features in chapter 2 are connected one another. It is frequently said that cooperative behavior among the bureaucracy, politicians and business world is pervasive: the so called "iron triangle" or "Japan Inc." The model suggests that the iron triangle can be viewed as an outcome of a nexus of relational contracts. The first section briefly introduces the conceptual framework by Levy and Spiller (1994) and extends it to feature both economic and political environments. The second section compares formal and factual procedures to legislate and implement in the Japanese regulatory regime with those in the U.S. regime. Then, I present a conceptual model for Japanese political exchange, which explains the iron triangle as a nexus of relational contracts. Finally, I refer to recent changes of the iron triangle, and explain the phenomena based on the conceptual model.

3.2.1 The Modified Framework

The structure of economic incentives is an essential component of regulatory economics. It has been the central preoccupation of virtually all theoretical work on regulation. The theoretical work has contributed to academic understanding of efficient public policy.

However, it has had little influence on regulatory outcomes.[5] Zajac (1995, p.4) points out that the considerable literature on economically efficient public utility pricing and policy usually had little influence in determining regulatory outcomes. Laffont (1994, p.535) also concludes that such idealized normative models are only a necessary first step, and without a second step, economists have little chance of being taken seriously.

Since a nation's patterns of economic and political exchange depend on economic and political environments, it is generally essential to characterize essential features of the "nation's specific institutional endowment" as well as "regulatory governance." These terms are introduced by Levy and Spiller (1994). I can define the **institutional endowment** as comprising a nation's legislative, executive and judicial institutions as well as other specific institutions. The regulatory-governance structure can be defined as the mechanisms that societies use to constrain regulatory discretion and to resolve conflicts that arise in relation to these constraints. Levy and Spiller (1994) assume that both regulatory governance and economic-incentive design (although they call it regulatory incentive) are choice variables in the hands of regulatory officials, and their choices are constrained by the nation's specific endowment that is exogenous.

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[5] See Zajac (1995) and Laffont (1994). See also Kaserman, Mayo and Pacey (1993) and Faulhaber (1995) for telecommunications.

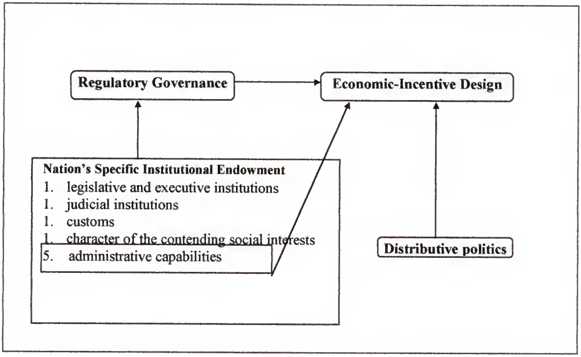
Regulatory Governance
Economic-Incentive Design
Nation's Specific Institutional Endowment
1. legislative and executive institutions
1. judicial institutions
1. customs
1. character of the contending social interests
5. administrative capabilities
Distributive politics

Figure 3. 1 The Conceptual Framework by Levy and Spiller (1994)

Figure 3.1 depicts their conceptual framework. In particular, legislative and executive institutions as well as judicial institutions were examined, and regulatory governance as a choice variable was viewed as being constrained by the endowment. Levy and Spiller (1994, p.208) also note that economic-incentive design depend not only on the endowment through regulatory governance but also on administrative capabilities and distributive politics (directly).

Their cross-country study shows that utility performance appears to be best in countries that have achieved a good fit between their exogenous endowment and their regulatory governance and incentive designs.[6] For example, both Jamaica and the U.K. have had sustained periods of high levels of private investment in telecommunications. They explain such performance by the existence of substantive restrictions on the discretion of the regulator: the use of very specific licenses provided companies with substantial assurances about the expected profitability of their investments.

Although Levy and Spiller (1994, p.201,203) mention that their results are also relevant in understanding the historical evolution of utility regulation in industrialized countries such as the U.S, some of the institutions may not be exogenous. As noted in chapter 2, such institutional changes in Japan happened during the Meiji Restoration around 1868 as well as during wartime around 1938. Furthermore, I already analyzed how social norms condition Japanese economic and political exchange. Thus, in order to compare utility performance among industrialized countries such as the U.S. and Japan, how institutional differences affect economic and political exchange should be examined in more detail.

A threefold modification in their framework is proposed here. First, I separate the institutional endowment into three broad categories: the "**social norms**" (including customs and ideologies); the "**political endowment,**" and the "**economic endowment**." I divide the original endowment into social norms and the political endowment because a change in social norms can cause a change in the other endowment, as the case of wartime Japan. Since I add "the economic endowment" to the framework, the original institutional endowment (except social norms) is now called the political endowment. It is important to give explicit attention to these categories for making a clearer conceptual framework.

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[6] They divide five countries into three groups: traditional parliamentary systems (Jamaica and the United Kingdom), the archetypal presidential system (Chile), and the rent-seeking presidential

Second, I use the term "economic-incentive design" rather than regulatory incentives because the term better reflects economic-incentive rules established by regulatory officials. Instead of using their concept of regulatory governance, we recognize the possibility that economic-incentive design can be determined by regulatory officials through political exchange with private interest groups.

Third, I allow the endowment to change. While the economic endowment is viewed as sensitive to economic-incentive design, the political endowment tends to be sticky because regulatory officials usually do not try to plan "political-incentive design" to improve behavior of the regulatory officials themselves. While the goal of economic-incentive design is to improve outcomes in market exchange, that of political-incentive design is an improvement in outcomes of political exchange through interest groups (including regulatory officials themselves). Since political incentive-design is more related to the whole constitution than economic-incentive design, it is relatively stable under the constitution. Recall that the Japanese bureaucracy has survived through several constitutional changes. Although I do not intend to analyze how social norms change, such change may cause changes in the political endowment, leading to new political-incentive design.

Thus, the objective of the modified framework is to analyze how regulatory officials derive economic-incentive design rather than to evaluate how well the economic-incentive design fits the institutional endowment. Economic-incentive design is determined by regulatory officials

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system (Argentina and the Philippines). Since it is difficult to distinguish such basic differences through political exchange in my framework while Levy and Spiller (1994, p.205) suppose that regulatory officials choose regulatory governance as well as economic-incentive design. If political-incentive design does not change in the short run, the political endowment can be viewed as fixed. Under this circumstance, political exchange among interest groups determines economic-incentive design. This situation corresponds to most positive models based on the economic theory of regulation, as long as the model reflects essential features of the political environment.

Although regulatory officials can propose reforms to the whole institutional endowment in a special situation, their concern is usually within their specific industry under the given institutional endowment. Wholesale alterations in political-incentive design are generally proposed by outside officials that reflect new social norms. Recall the Japanese constitutional changes: even the attempt to make the third constitutional change comes from the cabinet (rather than the ministry itself). Therefore, the political endowment is usually so sticky in the short run that regulatory officials view them as given.

Figure 3.2 shows the modified conceptual framework. The thin arrows show relationships between economic-incentive design and economic exchange through private interest groups, which is the object of most theoretical studies. The bold arrows show the political-incentive structure that determines economic-incentive design, which has been extensively analyzed using the economic theory of regulation. The broken arrow shows that economic-incentive design may change through changes in political exchange if a new political-incentive design is implemented.

While the first three elements of the institutional endowment are similar to Levy and Spiller and they are classified as the political endowment, the remaining three are newly introduced and they are called the economic (or market) endowment.[7] Each component of the economic endowment is closely related and indicates the stage of the nation's market system.

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among industrialized countries, we develop another approach here.

[7] Their "customs" and "the character of the contending social interests" as well as "distributive politics" are merged into our "social norms".

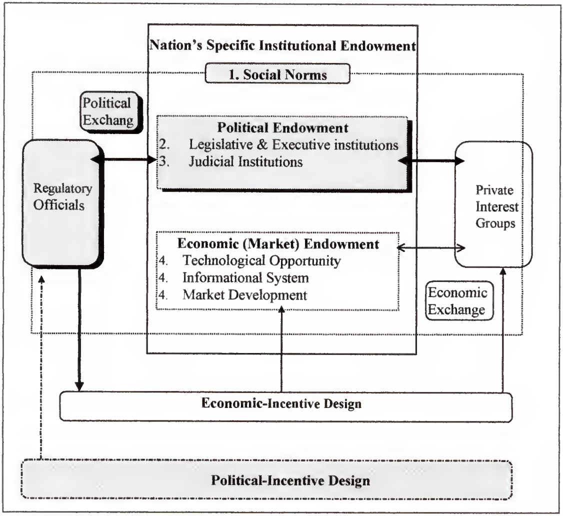
Nation's Specific Institutional Endowment
1. Social Norms
Political Exchang
Political Endowment
2. Legislative & Executive institutions
3. Judicial Institutions
Regulatory Officials
Private Interest Groups
Economic (Market) Endowment
4. Technological Opportunity
4. Informational System
4. Market Development
Economic Exchange
Economic-Incentive Design
Political-Incentive Design

Figure 3. 2 A General Conceptual Framework

As noted by Crocker and Masten (1996, p.7), the merits of markets relative to government regulation turn on the magnitude of the costs associated with market imperfection and failures relative to the costs of governing exchange administratively. Transaction-cost economics (TCE) suggests that we should use the market or regulatory system, depending on real-world transaction costs and associated net benefits. The relative costs depend on not only the political environment but also the current stage of the nation's economic environment. Since a firm generally operates in both environments, it is natural to consider both economic and political endowments as composing a nation's specific institutional endowment.

When more substitute goods are available or lower consumer search costs exist, the nation's market development is high because transaction costs of using the market system are low. Some artificial barriers to enter or exit markets also limit the market development. For example, as noted in chapter 2, Japanese ministries control entry and exit by using "**demand and supply adjustment clause.**" A main determinant of a nation's information system is search costs, but it is not necessary to limit search to market goods. Availability of information regarding activities for public (government) institutions is also included in the issue of the information system. Since the ministry uses informal regulation, search costs for a player without informal relations are significantly high. For example, the conditions that must be satisfied in order to enter telecommunications business have not been clear for entrants since 1985, although the MPT released a manual in 1996.[8] Furthermore, even MPT did not collect traffic data among message areas (MA) in message-toll service (MTS) until 1988, so no one could analyze the complete demand structure of MTS.[9] Both market development and the information system are closely related to the nation's technological opportunity, which depends on the nation's human capital and scientific environment.

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[8] MPT (1996b). A law to open information to public is not legislated yet in Japan.

[9] See Ota (1994, p.187) and Mitomo (1995, p.80)

While the economic endowment is relatively sensitive to an incentive structure even though regulatory practice limits the extent of market exchange, the political endowment is not sensitive because changes in the endowment involve indivisibilities. Given this condition, it is very costly for a single interest group to change the political endowment.

The new structure of economic-incentive design affects the market endowment through behavior of market participants or interest groups.[10] Changes in the economic endowment affect the utility level of each individual or group. Based on costs and benefits it faces, the group has an incentive to try to change or support the current economic-incentive structure through political exchange.

"Social norms" may endogenously change when the gap becomes large between actual outcomes produced from the current endowment and outcomes desired by citizens. In this chapter, however, it is simply assumed to be given as a institutional feature. Thus, we can focus on the short-run situation (as with recent deregulatory processes) where social norms are given and the nation's endowment is based on these norms.

Since this is a general conceptual framework, we need the following steps to identify salient features of the actual regulatory regime. First, it is important to identify what social norms are essential for a nation's regulatory regime. Second, we must identify how such social norms play significant roles in economic and political exchange. For example, I already find that relational contracts play significant roles in Japan while explicit contracts are dominant in the U.S. Although several features in Japanese political environment have been analyzed from the view of relational contracts, we have to develop how these features are related on the regulatory regime in more detail.

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[10] Although economic-incentive design affects not only private interest groups but also regulatory officials, we neglect the latter effects in the figure for simplicity.

3.2.2 The iron Triangle as a Nexus of Informal Relational Contracts

Since several features of economic exchange in Japan have been analyzed as a nexus of relational contracts, I present a conceptual model of political exchange in the Japanese regulatory regime. To do so, first, I compare a general regulatory process in Japan with that in the U.S. Second, I show that Japan's ministry frequently uses "shingikai" (a deliberation council) to transform its actual power into formal power based on a consensus among interest groups, which can be viewed as a nexus of relational contracts.

Formally, there exist two key stages in the regulation of an industry: legislation and implementation. Between the U.S. and Japan, these formal processes look similar but the substantive procedures are significantly different.

In the U.S, the Congress or a state legislature enacts a law that establishes regulatory powers over a particular industry like telecommunications; regulators such as members of the FCC replace legislators as central actors at the implementation stage.[11] Although the regulatory body has substantial discretion, its behavior must be consistent with the legislative mandate because decisions run the risk of being overturned by the courts. The commission must also go through a specified set of administrative procedures as part of issuing regulations.[12]

Thus, the key feature of the U.S. regulatory process is that it must be based on explicit contracts or written rules. Although both suppliers and consumer advocates lobby the government to try to influence the regulatory process, their objective is to get explicit contracts or written rules that yield favorable outcomes from their standpoint.

The formal procedure in Japan is similar to the U.S. procedure although local governments play a minimal role. If the cabinet approves draft legislation, it is submitted to the

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[11] See Viscusi et al. (1995, p.317-8).

[12] See Viscusi et al. (1995, p.19). The two major players in the federal rule making process are the regulatory agency and the OMB (Office of Management and Budget).

Diet through the Diet Policy Committee. After the Diet enacts a piece of legislation, a related ministry or bureau implements it.

However, since draft legislation almost always originates in the bureaucracy, interest group activity begins there: most of the legislative work has been completed before the Diet takes up the bill.[13] In fact, legislation initiated by House members is very rare. Thus, it is said that the bureaucracy writes nearly all laws and the Diet almost always rubber-stamps them.[14]

"Shingikai (a deliberation council)" is an organization that Japan's ministry (or bureau) uses to transform its actual power into formal power. The members of shingikai (including some bureaucrats) are appointed by the ministry itself, although the members usually include well-known scholars, journalists, businessmen, and noted representatives of interest groups. Since the bureaucracy forms shingikai at the beginning of legislation, shingikai often foreshadow government policy. Thus, Wolferen (1989, p.153) concludes that shingikai is commonly used by bureaucrats to help defuse or avoid oppositions to their plans.

However, these facts do not necessarily mean that the bureaucracy acts like a dictator, although the bureaucracy is certainly a dominant player as examined in chapter 2. It is formally always possible that the cabinet requests the ministry to revise draft legislation.

Suppose that the bureaucracy submits draft legislation to the cabinet without any consensus, the cabinet will not approve it due to concern over potential interest-group opposition. Thus, even though the bureaucracy uses shingikai to scatter and neutralize potential opposition to the plan as Wolferen (1989, p.145) argues, the bureaucracy often has to accept compromise to acquire a consensus. It is the most important task for the ministry and the individual bureaucrats to avoid sullying the reputation of the ministry.

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[13] Baron (1996, p.383).

[14] Wolferen (1989, p.33).

Note that informal relations are more important than formal linkages even in this initial stage. Recall that the ministry is not a formal legislator, and shingikai is just the ministry's advisory council. However, most processes of negotiation among main interest groups are frequently present in this initial stage. Although a ministry can appoint representatives of interest groups, the choices must reflect bargaining power of the groups in order to be able to enact laws. Since interest groups implicitly have to select representatives, firms must organize the industrial association to aggregate their opinions. Since negotiation regarding details of the draft sometimes requires compromise among various groups or members of a group, the bureaucracy often uses vague wording to facilitate obtaining a consensus. In implementing the rules, the bureaucracy may compensate some interest groups or members (that complained about, but signed, new legislation) in exchange for early agreement. This is a type of informal relational contract, which are made reliable by the anticipated mutual benefits from future exchange. The reason why the bureaucracy uses shingikai is to obtain this consensus..

While shingikai represents informal relational contracts from initial stages of legislative development, gyosei shido (informal administrative guidance explained in chapter 2) can be viewed as informal relational contracts at the implementation stage. These features are in contrast to the U.S. situation, where explicit contracts based on formal relationships are dominant. It may suggest that the essential difference between nations are enhanced by institutional complementarity in each country.

Under the circumstance where informal relational contracts are dominant in both legislation and implementation, it is a rational strategy for the regulated firms to accept amakudari to contact the bureaucracy or for the LDP members to become zoku politician to mediate between the bureaucracy and business. The amakudari system and the PARC (explained in chapter 2) contribute to reducing these political transaction costs. In other words, these features are institutional complement. Therefore, the Japanese regulatory regime can be viewed as a nexus of (informal) relational contracts.

Figure 3.3 depicts political exchange in the Japanese regulatory regime based on such a nexus of informal relational contracts. Since a politician mediates between a regulator and firms, a formal political exchange in Exchange A and B is usual. However, Japanese political exchange is quite distinct from that of the U.S. in the sense that it is heavily based on informal and personalized relations.

These close relationships are sometimes called the "iron triangle" or "Japan Inc." As long as the member's main objective is promotion, each ministry tries to expand its authority and seek more rents while the LDP members try to attract the political support of regulated firms. The most important feature is that the bureaucrat, politician and the businessman frequently achieve their goals based on informal relationships through habatsu, zoku, amakudari, shingikai and so on..

The bureaucracy can be viewed as a dominant player because it has substantial discretionary power over legislative and executive rocesses. The bureaucracy can provide special favors to regulated firms in the form of subsidies and barriers to entry. In order to get such favors, the firm can either use zoku politician as the mediator or directly give the bureaucrat future benefit through the amakudari system (in Exchange C). As already mentioned in chapter 2, the LDP members are elected on the basis of highly personalized campaigns and they must rely on koenkai. While the Diet member gives political funds and subsidies to the local politicians in his hometown (in Exchange D), the local politician promises to take care of local interest groups (in Exchange E). In this sense, the local politician also can be viewed as a mediator between the diet member and his voters.

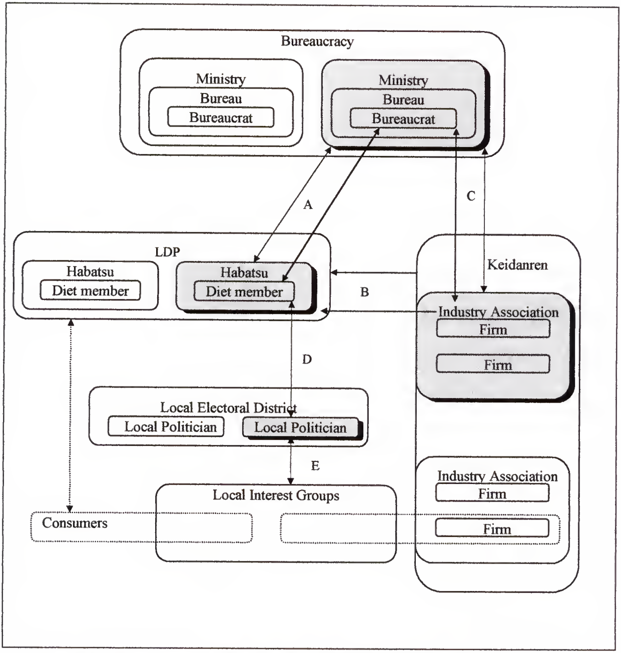

Figure 3. 3 Political Exchange in the Japanese Regulatory System

How much support the LDP member acquires (in Exchange B) depends on how much the politician (as an agent of the business) can affect the bureaucrats (in Exchange A). As already mentioned, a ministry also requests the LDP member powerful adjustment ability over the roles of the ministry to compete with other ministries: acquiring new rights for industry and larger shares of budgets. Thus, the LDP members try to create a larger faction; individuals seek higher seats within the fraction. While the LDP or Diet members cannot exercise influence over the bureaucrats when they cannot get enough political support from the business world, they cannot generate political support without having the ability to affect the bureaucracy. Thus, it takes a long time for zoku politicians to form close relationships with regulated firms and the bureaucracy.

Notice that "**horizontal competition**" within each interest group (including regulatory officials) is intense. Since substantial power in politics is often informal, both the bureaucracy and business try to form close relationships with powerful politicians. Political competition is especially hard. Hori (1990, p.55) mentions that such hard competition within each group produces close relations among interest groups. A LDP member must form close relations with a group of firms and bureaucrats in order to compete with other members who form close relationships with other groups of them.

In other words, the iron triangle can be viewed as an outcome of horizontal competition between groups based on informal relational contracts. Since these contracts are based on long-time relations, a move from one group to another group is usually costly. Thus, each bureaucrat, politician and businessman tries to not only make relations within the group tight but also attend other groups for insurance.[15]

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[15] For example, not only the MITI but also the MPT organize special corporations on their own HDTV systems (so called Hi-Vision). Then, most of makers for electrical appliance as (SONY, Hitachi and Toshiba) have to support both organizations to keep good relationships, which results in inefficient investment.

Therefore, Japan's bureaucrat is a dominant player, but she is constrained by several relational contracts. She also faces horizontal competition among the ministries or within the ministry. In particular, the existence of powerful factions and zoku members mediate between the bureaucracy and business world. The iron triangle is based on the existence of this powerful mediator. In other words, the existence of powerful factions and zoku politicians contribute to limiting the extraordinary degree of discretionary power of the bureaucracy.

3.2.3 Recent Changes of the Iron Triangle

There is an implicit hierarchy of bureaucratic prestige and power of Japan's ministries. Okimoto (1988, pp.319-20), based on interviews with 21 samples of government officials, clusters the ministries into five groups: while the MITI and MOF are ranked as the first group of most powerful and prestigious, the MPT, the **Ministry of Health and Welfare (MHW)** and **the Ministry of Agriculture, Forest, and Fisheries (MAFF)** are ranked the third in terms of power and prestige. He also suggests that the number of amakudari can be the best unobtrusive indicator of relative bureaucratic power and it also corresponds roughly with the hierarchy of power constructed from interview data.

Table 3.1 shows the number of amakudari of ministries, and Figure 3.4 depicts the shares among the ministries: the MOF has the largest share of amakudari.[16] These absolute numbers may roughly reflect how many firms they heavily regulate. In fact, Figure 3.5 shows that the averaged number of the MITI is the same as the MOC, which is smaller than the MAFF and MOT. As mentioned in chapter 2, these ministries use the second budget and entry regulation.

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[16] As noted above, this is an official definition of amakudari. Thus, the number of amakudari from the Ministry of Justice, Ministry of Foreign Affairs and Ministry of Local Autonomy are negligible.

Table 3. 1 The Number of Amakudari*

Ministry	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Prime Minister's Office	15	21	12	23	26	17	21	11	14	9	16	14
Ministry of Finance	65	69	67	66	69	66	66	61	64	74	64	73
Ministry of Education	8	5	13	14	11	13	10	18	15	10	8	12
Ministry of Health	5	2	6	6	10	7	7	6	1	5	6	5
Ministry of Agriculture	45	42	44	44	51	35	52	31	41	27	26	26
MITI	26	34	36	28	40	27	30	21	28	31	28	21
Ministry of Transport	35	44	40	63	57	30	30	34	41	27	23	26
MPT	22	20	17	26	29	28	24	28	19	18	21	10
Ministry of Labor	1	1	4	2	4	0	2	2	3	1	0	0
Ministry of Construction	27	30	27	23	23	29	20	21	22	28	26	22

Source: National Personnel Authority, *Eiri Kigyo e no shushoku ni kansuru nenji hokokusho (Annual report on private-sector employment personnel)*, Tokyo.

* The post-retirement employment of bureaucrats (in an industry that they had worked closely during their government services) is prohibited without the permission of the National Personnel Authority.

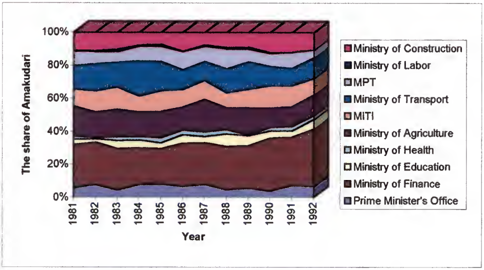

Figure 3. 4 Share of Amakudari across Agencies

Source: See Table 3.1

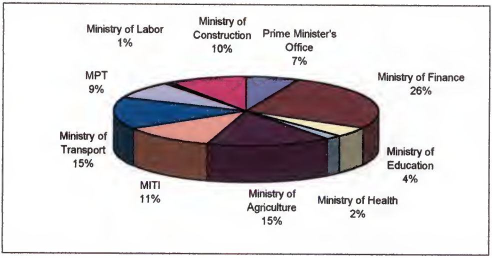

Figure 3. 5 Average Share of Amakudari across Agencies (1981-92)

Source: See Table 3.1

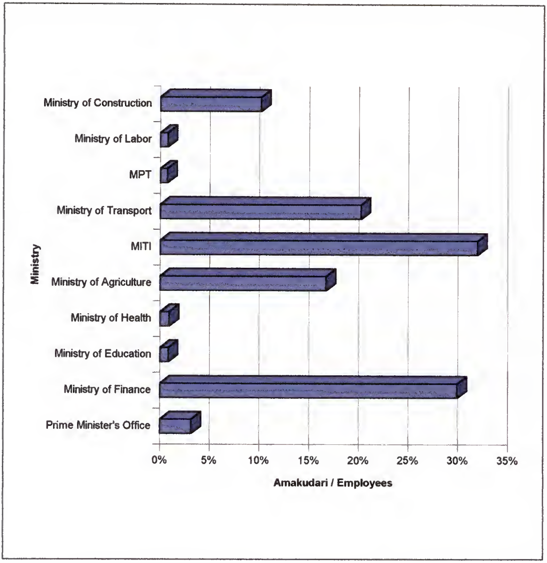

Figure 3. 6 Ratio of Average Amakudari to Employees*

Source: See Table 3.1
* Here the number of employees is the number reported in the budget.

Note that there exist significant differences of the size of ministries. For example, the number of the total employees of the MITI is smaller than a half of that of the MOF. Thus, the relative ratio to the number of the total employees (fixed number) may reflect relative prestige more. Figure 3.6 shows the ratio of average amakudari to this fixed number in 1993: the MITI as well as the MOF are top ranked.

A reason why the MITI and MOF have the greatest prestige is related to the social norms in the second constitutional change: these institutes were responsible for Japan's catching up as an industrialized country. Industrial policy by the MITI and the convoy system by the MOF have been viewed as most important policies contributing to achieving the national goal. Thus, these ministries can control prominent firms by using an extraordinary degree of formal and discretionary power.

Nowadays, however, even the MOF and MITI are loosing prestige because of two reasons: (1) Since the success of industrialization develops the market system, such an extraordinary degree of power of the ministry begins to lack a rationale; (2) Disappearance of powerful factions or a dominant party helps the ministry to expose abuse of powerful and discretionary authority so that the ministry loses its prestige.

The first reason corresponds to the fact that political-incentive design has never changed drastically, and implies that the ministry cannot change its behavior by itself. The convoy system protects the banking industry from competition, and industrial policy promotes growth industries that would enjoy growing export demand in the world market. Nowadays, these main banks are ranked as the largest of the world, but the MOF continues to regulate them in a formal and informal way. The MITI also continues to apply industrial policy to most industries and find a new reason for intervention, even in the most developing industry like the automobile industry.

Furthermore, recall that financial reconstruction requires a series of administrative and economic reforms, and the MOF plans and executes both taxes and budgets. However, the Jusen problem brought about 7 trillion yen bad debt, which also brought an argument on the MOF divestiture.[17] **"Jusen (a housing loan corporation)** " speculated in inflated wealth in securities and land in 1986-89 (so called the bubble economy). Although jusen is an non-bank financial institution, jusen's major managerial position is held by the amakudari member from the MOF: The resulting bad debt will be paid off by taxes in 1996.[18] Thus, in spite of the fact that the official norm of the MOF is financial reconstruction, even the MOF does not have strong incentives to achieve financial reconstruction against ministry's rent-seeking incentives.

These facts show that this rent-seeking mechanism (formed in the old fashioned social norms) still controls the ministry's behavior. In other words, even though the ministry agrees that one of the most important social norms can be expressed as financial reconstruction, an incentive mechanism to guide the ministry to the new task does not exist.

The extraordinary degree of power of the ministry not only begins to loose the reason for being but also has involving several scandals. The recent disappearance of powerful factions in the LDP yields another conservative party.[19] Since zoku members of two conservative parties have to compete to mediate between business and bureaucracy, the relative power of bureaucracy significantly increases. In other words, "direct" political exchange between the bureaucracy and business world (in Point C depicted in Figure 3.3) is becoming popular.[20] Therefore, many scandals of high ranking officers have been revealed and social norms on the status of bureaucracy have dramatically changed.

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[17] See *Economist Weekly (in Japanese)*, March, 4, 1996. See also Aoki et al.(1994) and Ueda (1994) for the jusen problem.

[18] At that time, even the state-owned Japan National Railways Settlement Corp.(JNRSC) was required to refrain from selling its land. Thus, the MOF also set a limit to the bank's loan at that time. However, 17 banks out of 21 show a loss and the total is over 3 trillion yen in 1996. While the total reported bad debt in 1995 is 22 trillion yen, another possible bad debt is estimated as 26 trillion yen. See *Toyokeizai*, October 26, 1996 and April 27, 1996. Although budget deficit-GDP ratio in Japan is lower than that in the U.S, the accumulated debt-GDP ratio is over 80%, which is much higher than around 60% in the U.S. In particular, JNRSC still owes 27 trillion Yen (greater than in 1987). Because JNRC was required to refrain from selling its wealth, the estimated value of its land falls to around 4 trillion yen in 1995 from 15 trillion yen in 1990. See *Toyokeizai*, December 9, 1995.

[19] The LDP once fell from power in 1993. Takeshita's habatsu was split, and a quarter of the LDP members made the current New Frontier Party with members of other parties.

For example, in 1996, the MHW revealed the AIDS scandal while the MITI had the Izumii scandal.[21] The AIDS scandal arose when the ministry officials refused to import heat-treated blood products in order to give a domestic maker (that was producing contaminated blood products) time to develop its own version: more than 400 patients have died. As for the Izumii scandal, it is said that most of the high ranking officers got some funds. Note that the direct mediator is not a politician but a businessman or a doctor (although the businessman, Izumii also gave politicians some political fund).

These scandals are featured as outcomes of direct relations between business and bureaucracy. These recent scandals are contrasted with the Lockheed scandal and Recruit scandal which involved leaders of powerful factions (as depicted in Point B in Figure 3.3). Thse cases suggest that as the degree of discretionary power of bureaucracy increases, such scandals are repeated until the extraordinary degree of discretionary power of the ministry is limited. For example, the MHW recently revealed another scandal: the new highest ranking officer received funds from an organization that is controlled by the MHF. Therefore, these scandals should be viewed as structural phenomena rather than temporal.

3.3 The Current Regime in Japan's Telecommunications

Using the conceptual framework, I explain essential features of Japan's telecommunications industry and the regulatory regime. The second section examines the deregulatory processes. This analysis suggests that a political game among interest groups forms the current regulatory regime, and the regime can be characterized as managed price competition under controlled entry, which is similar to the convoy system operated by the MOF.

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[20] The new law about political funds may make a politician difficult to work as the mediator. Furthermore, competition between two conservative parties may be likely to expose illegal political exchange.

3.3.1 Japanese Telecommunications Industry

The former MPT begun telecommunications service in 1890, and the state-owned monopoly, NTTPC and KDDPC engaged in domestic and international services respectively in early 1950. Because of financial reconstruction, they were part-privatized as special companies: NTT and KDD were born in 1985. This step is the first reform. The MOF raised 10 trillion yen by selling NTT stocks since the MOF first sold 1650 thousand of NTT stocks at 1.2 million yen in November 1986.[22]

Then, three new laws including **the Telecommunications Business Law (TB Law)** and **the Nippon Denshin Denwa Kabushiki Kaisha Law (NTT Law)** created the current regulatory regime as its "formal" features: the **new common carriers (NCCs)** are regulated by the TB Law while NTT (KDD) is regulated by both the TB Law and the NTT Law (KDD Law).[23] In fact, in 1986, three NCCs entered private line in long distance service: Daini-Denden Inc.(DDI), Japan Telecom Company(JTC), and Teleway Japan Corporation (TJC). Similarly, Tokyo Telecommunications network (TTN) (the only NCC currently providing public local telephone service) entered the Kanto-area market around Tokyo in local service.

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[21] See the Diamond Weekly, 7, December, 1996.

[22] 1.95 million of stocks at 2.55 million yen were sold in November 1987 and 1.5 million of stocks at 1.9 million yen were sold in October 1988. However, the MOF has stopped selling the stocks because the prices has been decreasing as depicted in Figure 3.7. Some of these recent information is available on the WEB sites of the MTP (http://www.mpt.go.jp/index-e.html) and NTT (http://www.nttinfo.ntt.jp).

[23] See Nambu et al (1989), Koike (1990), Naoe (1994) and Ozawa (1994) as well as the above WEB information for the current regime.

The current status of the Japanese telecommunications is viewed by some as involving new entry that promotes severe price competition, in particularly in trunk service. Rates have decreased and the market share of NCCs has increased, which looks similar to the U.S. experiences. The rates per three minutes in trunk call between Tokyo and Osaka decreased from 400 yen in 1985 to 170 yen in 1995, and the share of the NCCs has increased to over 50%. In the Japanese regulatory regime, however, actual rules are frequently different from formal rules. I show that these results do not stem from market competition but from a kind of convoy system controlled by the MPT.

The TB law divides the telecommunications industry into two categories of firms: "type 1" carriers provide telecommunication service using their own network facilities; "type 2" carriers mainly provide enhanced (value added) service by leasing network facilities from type 1 carriers.[24] The activities of type 1 carriers have been heavily regulated through licensing, tariffs, service conditions and investment activities. The carrier can neither enter nor exit without permission from the MPT or the minister. The rate level and rate structure of service are subject to the **rate-of-return regulation (ROR)** based on the fully distributed cost.

NTT (as well as KDD) not only belongs to Type 1, but also has some extra burdens: (1) NTT must continue to supply "universal and equitable" service; (2) NTT is prohibited from serving international service (while KDD is prohibited from domestic service by the KDD Law); (3) NTT cannot engage in mixed service with broadcasting because of separation between telecommunications and broadcasting; (4) because it is a special company, the executives and managerial plan cannot be chosen without government approval.

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[24] Type 2 carriers are further classified into two types: "special type 2" carriers own some facilities and engage in international telecommunications services; "general type 2" are the others.

Table 3. 2 The Number of Firms in Telecommunications

Type				Mar.1993	Mar.1994
Type 1	Domestic Services	NTT		1	1
		NTT DoCoMo		9	9
		NCCs	Trunk-call Service Provider	3	3
			Local-call Service Provider	10	11
			Communication Satellite Service Provider	2	2
			Mobil Network Service Provider	58	82
	International Services	KDD		1	1
		NCCs		2	2
	Total			86	111
Type 2	Special			39	44
	General			1550	2063
	Total			1589	2017

Source: MPT (1995b, p.59)

Table 3. 3 Operating Revenues (OR) and Net Income (NI)

Type		Mar.1993		Mar. 1994	
		O.R.	N.I.	O.R	N.I.
NTT		5892	249	5809	109
NCCs	Trunk-call Service Provider	475	36	601	26
	Local-call Service Provider	69	1	75	6
	Communication Satellite Service Provider	33	-3	33	-6
	Mobil Network Service Provider	246	25	311	40
KDD		240	27	246	28
NCCs		68	-2	86	9

Source: MPT (1995b, p.70). Billion of Yen

Table 3. 4 Operating Revenues (OR) and Net Income (NI) in Trunk Service

		DDI	JTC	TJC	NTT*
Mar. 1993	O.R.	231	204	40	
	N.I.	24	20	-8	
Mar. 1994	O.R.	293	251	56	1010
	N.I.	23	16	-13	359

Source: MPT (1995b, p.67.69). Billion of Yen

*The values of the long-distance communications sector.

It is clear from these constraints that the regulatory structure may not promote market competition towards a seamless multimedia network. The regime also has problems for free and fare market competition in trunk service. First, imposing universal service forces NTT to continue to cross-subsidize local-call service. Second, there is no guideline on interconnection issues. Third, a variety of services and economy of scale may not exhibit because of artificial division of markets. Fourth, the ambiguous conditions for entry raise transaction costs for business opportunity (because only a few firms have the long-term relationships with the MPT).

Since regulation is based on not services but providers, this classification is different from the U.S. conventional dichotomy between basic and enhanced service. Table 3.2 shows that the MPT classifies domestics type 1 NCCs into 4 categories, based on areas and facilities: trunk rules are frequently different from formal rules. I show that these results are not from free and fair market competition but from a kind of the convoy system controlled by the MPT.

Table 3.3 shows that NTT is still a dominant player in local service while KDD is also a relative giant in international service. The share of four largest (above mentioned) NCCs of total traffic times in 1994 is only 6.6%, but thier share of the most profitable trunk-call area service is 54.4%.[25] The share of NCCs in sales of cellular and mobile telephone service in fiscal years 1989 and 1993 arose from 11% to36%.[26] Table 3.3 confirms that the size of trunk-call market for NCCs is largest and the growth rate of mobile network service is highest. In the latter market, **the Personal Handy Phone System (PHS)** introduced in July 1995 became popular very rapidly: from 1995 to 1996, the number of cellular and mobile phones increased to 18 million from 8 million, while the of PHS increases to 5 million from 0.1 million.[27]

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[25] It is the market among the big three prefectures (Tokyo, Osaka and Aichi). The share among all prefectures is 29.1%. The total is defined as the sum of NTT and the big four NCCs because the output of the others is negligible. See MPT (1995b, p.5).

[26] See MPT (1995a, p.17).

[27] The PHS is a wireless phone as a cellular phone but its distance is limited within a couple of hundred meters. However, the costs are lower because radio stations and ISDN networks are used.

However, entry into these markets does not appear to be significant. The number of firms in trunk-call market never changed after the three NCCs entered private line (and public telephone) services in 1986 (and 1987 respectively). Similarly, in local service, no firm has entered into even the Kanto area around Tokyo after TTN entered. Although the number of firms in mobile-network service looks large, only a couple of firms are available for mobile and cellular phone in each area.[28]

The lack of entry is explained by regulatory policy. DDI wanted to enter international service and TTN wanted to enter trunk-call service. Despite the potential economies of scope that might have brought costs and prices down, the MPT refused them.[29] Because of "the demand and supply adjustment clause" in the TB Law, the MPT can actually control both entry and exit at its discretion. Several firms have faced deficit but they never exit.

This protective policy is similar to regulation by the MOF, MITI and MOT Recall that the MPT did not collect traffic data among message areas in message-toll service (MTS) until 1988. So no one could analyze the complete demand structure of MTS in spite of the demand and supply adjustment clause.[30] Furthermore, since TTN is a subsidiary of the huge electric monopoly in Kanto district, TTN has a vision of a nationwide network constructed by subsidiaries of each electric monopoly in the other districts. Observers argue that the MPT was afraid that MITI would have influence on telecommunications policy because the electric industry is regulated by the MITI.

Notice that the number of total lines is 61 million (including 19 million business lines) and the growth rate is around 2.5% in resent years.

[28] In this market, it is usual for a parent company to have several regional subsidiaries and all of the firms are counted as part of the overall market. For example, NTT DoCoMo has eight regional subsidiaries. In spite of the high growth rate, several NCCs face deficit.

[29] See Kato (1996, pp.42-3) and Fujii (1996, p.116). Similar things happened in mobile network service. Because the conditions that must be satisfied in order to enter telecommunications business were not clear for entrants, the MPT finally released a manual in 1996. See MPT(1996b).

[30] See Ota (1994, p.187) and Mitomo (1995, p.80)

Under controlled entry, "price competition" in trunk service results in an important feature of business conduct: the rates set by three NCCs have been almost the same (about 10 yen lower than the fee set by NTT). This behavior may seem to be reasonable when firms with similar technologies compete with each other to sell homogeneous goods. However, the MPT is officially supposed to approve the prices based on the ROR regulation. Table 3.4 shows that the NCCs are less profitable than NTT. Note that arbitrary cost allocations may make such comparisons unreliable. Nevertheless, TJC has faced deficits (although it is supposed to escape from deficits in 1997). It seems to appear that the MPT does not utilize ROR regulation. In fact, since prices are based on fully distributed cost, there is no effective distinction between local-call and trunk-call services.

Furthermore, the access charges have been set under the marginal costs although NCCs have faced another interconnection issues as mentioned later.[31] In other words, the MPT induces NCCs to cream skimming. However, NCCs seem to be less efficient under the current basic conditions. Thus, after NTT re-balances its rate structure, NCCs will face problems under free and fare market competition. In this sense, how to set access charges is a central issue for market competition, but it is not officially determined yet.

Therefore, the MPT actually tries to imitate the convoy system by the MOF, and it faces some problems. The NTT Law plays a role by not only prohibiting NTT and KDD from competing each other, but also limiting entry into local service by requiring NTT to supply universal service (that results in lower rates in local service). **Community Antenna TV (CATV)** service is still in its infancy, and inadequate cash flows make it impossible to compete against artificially lowered rates in local service. NTT still controls bottleneck facilities. Recently, cream skimming in trunk service forced NTT to raise its rate in local service. Then, NTT criticized current communications policy by the MPT. NTT finally changed its rate structure in local service in February 1995. The announcement by the NTT was unusual in Japan since it brought regulatory politics out into the open. The local price increase contributed to rapid increase in net income in March 1996.[32] I shall examine this impact of NTT's strategy on the deregulatory processes in the following two sections.

3.3.2 The First Reform as a Nexus of Informal Relational Contracts

The first reform was based on the third report in 1982 by the Provisional Commission for Administrative Reforms, which recommended splitting NTTPC (into a central company and some regional companies) and privatizing them. As Kato (1996, pp.18-24) stressed, however, most of the members viewed a regional company as a service company providing inspection and maintenance (not high-tech telecom services). The image of the NTTPC divestiture at that time was totally different from the ATT break up in 1984. The main point of the first reform was to promote financial reconstruction by raising NTTPC's efficiency. NTTPC had 20 billion yen of artificial accounting income in 1980 and was estimated to yield deficit in 1985, while NTTPC staff worked only about 37 hours per week and 141 days per year.[33]

The telecommunications industry performance has several problems stemming from the iron triangle. The first reform can be viewed as a political game among interest groups. Although the ministry is a dominant player in the regulatory regime, the cabinet has to tackle a constitutional change at the level of industries because of the implantation for financial reconstruction. Using the

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[31] Before 1994, NCCs did not have to pay NTT's deficit in local service. Then, NCCs pay only its portion of traffic sensitive costs (TSC), NTT rebalance its rate structure. See Kojyo (1994).

[32] According to the annual report in 1996 by NTT, net income increased to 274 billion yen from 85 billion yen in 1995 fiscal year. Telephone service by cable TV companies begins in 1997 but only 5% of homes enjoy cable TV service. See Koike (1990) for an analysis of the regulation on cable TV services. Since Perfect TV and Direct TV enter direct broadcasting satellite (DBS) service, it is possible that DBS service will become more popular than cable TV service.

[33] See Kato (1996, pp.18-22).

conceptual model in Figure 3.2 and 3.3, I shall explain the deregulatory processes based on the following informal institutional features.

First, recall that the Provisional Commission for Administrative Reforms was different from a usual shingikai (deliberative council) like the telecommunications Council in the sense that the former reports to the prime minister while the latter reports to each ministry. Thus, the Commission was used by the cabinet to help defuse or avoid oppositions to its plan. The MOF also supported privatization for financial reasons. However, the Commission's report did not reflect MPT's opinion very much. The MPT and the MPT zoku politicians were adamantly against both privatization and the divestiture. On the other hand, NTTPC and the labor union finally agreed with the privatization but not the divestiture. In sum, only the MPT was strongly against privatization.

Second, in order to help promote the cabinet's plan, the cabinet chose Toshio Doko (who was the former president of the Keidanren, the most powerful business organization) as the president of the Commission. He chose the president of NTTPC from the business world in 1981 (after the NTTPC scandal), and the president of NTTPC finally persuaded his managers to agree to privatization in 1985.[34]

Third, the Commission members used the influential LDP politicians to avoid oppositions to its plan. Although the MPT zoku were against the first reform, some influential members of the commission persuaded the leaders of zoku based on financial reconstruction. Ryuzo Sejima (an influential member of the Commission) persuaded Shin Kanamaru (the leader of the MPT zoku). Similarly, Hiroshi Kato (the president of the sub commission) met with Kakuei Tanaka (the leader of the maximum faction).[35] They also met the leaders of the mammoth company union of 310 thousand workers and confirmed that the union was not necessarily against privatization. Privatization was viewed as promoting wage increases because the wage structure at that time was the same as other public utilities (which were running deficits).

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[34] The president, Shindo, once worked under Doko in the same company. The vice president group was against the reform. See Kato (1996, p.18).

[35] See Sejima (1995), *Ikusanga*, Sankei-shinbun, Tokyo,p.389 and Kato (1996, p.22). Tanaka just asked Kato "how much money can the government save by privatizing three state-owned

Thus, the final report in 1983 had consensus among most major interest groups, and the MPT legislated the above three laws in 1985. NTT was part-privatized as a special company, and a decision on the NTT divestiture was postponed for 5 years.[36] This is a good example of the Japanese legislative process, reflecting political exchange based on informal relational contracts. The first reform is a natural outcome from the contract's point of view because most of major interest groups finally agreed with part-privatization but not the divestiture.

This situation can be contrasted with the 1984 AT&T divestiture, although AT&T was a private company. A key point is the differences of past regulatory policy. Since a series of regulatory decisions contributed to the emergence of competition in the industry in the U.S, there existed rivals against AT&T.[37] However, there was no rival facing NTTPC, because the MPT never tried a regulatory policy facilitating entry. In fact, the existence of new rivals after the first reform influenced on the second reform.

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firms?" Kato answered "it can save about three trillion yen," and Tanaka just said "I understand." Kanamaru belonged to Tanaka faction. See also Hayasaka, Shigezo (1995), *Kenryoku no Shisaitachi*, Tokyo, Shueisha and Wolferen (1989)for Tanaka.

[36] This adjustment was mediated by LDP politician, Hashimoto (current prime minister) who also belonged to Tanaka faction.

[37] Sappington and Weisman (1996, p.31) suggest that three regulatory decisions were particularly influential: the Above 890 decision (1959), the Carterfone decision (1964), and the Specialized Common Carrier decision (1971). In fact, MCI sought Department of Justice (DOJ) antitrust action against AT&T. As the U.S. court decision gave MCI a legal right to offer Execunet, the functional differences of the court system are also substantial.

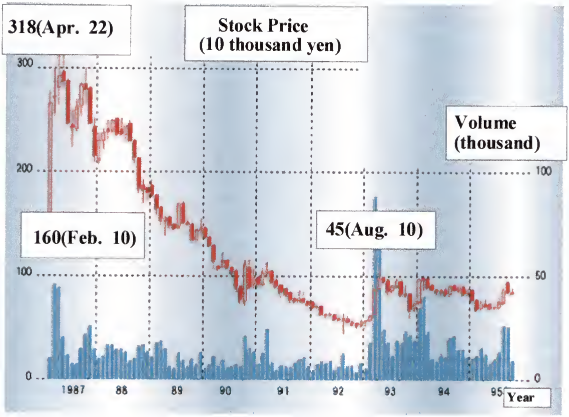

Figure 3. 7 NTT Share Prices

Source: NTT WEB information and materials (http://www.nttinfo.ntt.jp)

3.3.3 The Second Reform as the Unusual Political Game

After the first reform, while the MPT had opportunities to enjoy its discretionary power on entry and price setting as mentioned above, the MPT organized its shingikai (the Telecommunications Council) to produce the report in 1990. In this case, the Telecommunications Council is used to help defuse or avoid opposition to the MPT's plan.

In spite of the fact that the MPT was adamantly against privatization and divestiture in the first reform, the report recommended splitting NTTPC into a central company and two regional companies. The MPT learned how to seek rents in a new environment.

Although a final report by shingikai usually foreshadows government policy, this report did not obtain consent from NTT or the MOF. As Figure 3.7 shows, the share price was going down after the bubble economy, and the MOF was afraid that the price would fall more via the divestiture. Thus, decision making was postponed again to 1995. It is unusual that a report by shingikai is refused: it is a mark of shame for the MPT or the Telecommunications Bureau. In other words, the MPT must have been eager to break up NTT, even though the bureaucrats were aware they risked of a mark of shame. Notice that the bureau had few experiences to organize private firms unlike the MOF and MITI. In this sense, it may not have been matured to obtain consensus in a sophisticated way.

This report has announced that one of MPT's final objectives was the NTT divestiture. As long as NTT decides to be against the divestiture, there no longer exist mutual benefits for both players. This relationship was unusual in the Japanese regulatory regime. Because of this reason, the political game between the MPT and NTT regarding the 1995 reform was played with great intensity..

The MPT argued that NTT enjoyed monopoly power over local service and controlled a bottleneck facility (creating interconnection problems). NTT responded by suggesting that current policy had contradictions and that extraordinary intervention by the MPT actually disturbed market competition. However, most independent economists agree that efficiency would be enhanced by abolishing the extraordinary degree of regulation with distinctions among markets, formal and informal intervention on entry and exit, service menu and price setting as well as mandated investment plans. Most would agree that NTT has monopoly power over interconnection issues. The NCCs face many problems, including the portability of identification numbers, the level and structure of interconnection charges, and point of interconnection (POI) issues.[38] Unlike the U.S. situation, neither NTT nor NCCs will go to courts in this circumstance. The firms choose informal relational contracts with the MPT.

In 1994, however, the MPT proceeded to condemn NTT's position and ordered it to connect to NCCs. NTT has monopoly power over interconnection: although the share of NTT local loop used for telephone service (including cellular phone and the PHS) is over 99%, there are neither guidelines nor rules on interconnection in the NTT Law. This is unusual in the sense the MPT did not use informal relational contracts based on this credible threat. The MPT seems to prefer marking shame on NTT to developing informal relationships.

Therefore the MPT can use NCCs to justify its position: the MPT chose the president of the Tokyo Denryoku Corporation (that is a parent company of TTN) as the president of the Telecommunications Council. This is also unusual because it is appear that this shingikai is designed to benefit the ministry and firms except NTT. Before the report was announced, the MPT tried to change its image of exercising excessive intervention by issuing the manual for market entry and the deregulation package.[39] Then, the report in February 1996 again recommended splitting NTT into a long-distance company and two regional companies.[40]

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[38] As the MPT addressed these problems as a mediator, an end-to-end rate and a principle of one POI in each prefecture were established in 1994. See Naoe (1996) and Kojyo (1994). Although arguments against divestiture are made in the basis of international competition, technological opportunities and optimal managerial oversight, there is no evidence that such considerations outweigh the inefficiencies associated with managed competition (partly because availability of data is limited in Japan).

According to this report, long-distance NTT would be completely privatized and allowed to enter cable TV, international and regional services. Each regional NTT would be also allowed to enter telephone and cable TV services outside its operational area although it is still treated as a special company to ensure continued provision of universal service. Thus, the report includes several carrots for NTT in exchange for the divestiture.

However, again, decision making has been postponed to 1997. At this time, there were many reasons for delay. For example, as one of exogenous reasons, Fujii (1996, p.181) suggests that the cabinet had some incentives to avoid decision making; (1) the cabinet had to make progress towards solving the bad debt of the jusen problem, which had the possibility of causing dissolution of the Diet; (2) the cabinet consisted of not only the LDP but also the Social Democratic Party, which was strongly against the divestiture. As one of endogenous reasons, Keidanren cannot report a clear conclusion on the divestiture: while the NCCs support the MPT, NTT family members (like NEC and Fujitsu) strongly support NTT.[41]

One of the most important reasons for delay is that NTT tried to solve the interconnection problems by itself after the MPT ordered NTT to connect to NCCs in 1994. Such unilateral exercise of initiative was an unusual and also a mark of shame for NTT.[42] NTT has six thousands local (intra-city) switching offices that are connected to 60 millions local loops. In march 1995, NTT announced that NTT would allow cable TV companies to connect to its local offices. In September 1995, NTT also announced that NTT would allow NCCs to directly connect to its local loops, and also requested the MPT to establish an independent authority to make and monitor new rules for interconnection issues.[43] Such an authority would cause the MPT to lose its most important reason for breaking up NTT. In other words, NTT burned its bridge: NTT tried to show that NTT can not execute monopoly power over bottleneck facilities.

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[39] See MPT (1996a,b,c).

[40] See MPT (1996c), Naoe (1994), Obi (1996) and Fujii (1996).

[41] See Fujii (1996, chapter 4). The report by Keidanren is influential in particular on politicians.

Therefore, these deregulatory processes can be viewed as outcomes of a political game between interest groups, in particular the MPT and NTT. While the first reform (as an outcome of informal relational contracts) created formal elements of the current regime, the unusual political game between the MPT and NTT lead to the second reform, promoting some competition. The MPT announced its preference for deregulation and NTT declared its support for open networks. An arrangement can be made that in neither case are the players truly concerned with the broader public interest in promoting allocative and innovative efficiency.

3.4 The MPT's Rent-Seeking Hypothesis and Other Views

The first section presents the "MPT's rent-seeking hypothesis," which views these deregulatory process as outcomes of the MPT's rent-seeking under several constraints. Changes of these constraints after the first reform explain unusual behavior of the MPT and NTT towards the second reform. The second section compares my observasions with those emerging from the literature on the U.S. The recognition of rent-seeking behavior of powerful and discretional authority yields different implications.

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[42] NTT created a task force to avoid the divestiture in January 1995, where NTT begun to develop new strategies on interconnection issues, multimedia and international services. See Fujii 91996, 25).

[43] Notice that any NCC at that time did not request such direct connections and even the MPT did not know this announcement before that day. In December 1995, the MPT announces deregulation. See Fujii (1996).

3.4.1 The MPT's Rent-seeking Hypothesis and the Second Reform

As mentioned above, NTT and the MPT have been two main players in the industry after the first reform in 1985. The second reform on breaking up NTT has been postponed three times, in 1983, 1990 and 1996, because the MPT could not get enough support to break up NTT. At the end of 1996, the MPT itself finally announced that NTT will be restructured into one long-distance communications company and two regional communications companies, under a purely holding company.

Recall that a pure holding company is illegal in Japan and the ministry is just an administrative organization to implement the regulation. However, it is likely that NTT agreed with the MPT and so the MPT announced it. Most Japanese believe that this announcement foreshadows the second reform. Both players finally agree with this informal relational contracts, which is distinguished from the typical U.S. political exchange.

We already know that the MPT intended to break NTT up in 1990 and 1996 while the MPT opposed the divestiture and privatization of NTTPC in 1985. The above mentioned announcement also intends to break NTT up, although a "virtual" holding company may control them.

In order to explain the reason for the change, I present "**the MPT"s rent-seeking hypothesis**," which consists of two parts: (1) the first reform initiated by the cabinet gave an opportunity for the MPT to recognize benefits produced from a typical Japanese regulatory regime (which has been utilized by more powerful ministries, like the MOF and the MITI); (2) the current second reform advocated by the MPT intends to increase its benefits based on its utilization of this rent-seeking process.

I also explain why the first reform took an usual form of Japanese political exchange but an usual political game has been played after the first reform. Even though the ministry seeks its rents, it faces some constrains based on informal relational contracts. Especially, the disappearance of powerful "habats (faction)" increased the relative power of the ministry. The NTT divestiture yields enough rents for the bureau to take unusual behavior. In addition, the bureau had few experiences making informal relational contracts (as singikai-based procedures) with private firms. On the other hand, NTT had relatively strong bargaining power, and used smart strategies to obtain public support. Thus, the recent political game was unusual in the sense that the MPT excluded NTT as the partner on its informal relation contracts.

I shall show some evidence to support this political hypothesis. First, from the economic point of view, it is difficult to see why the MPT opposed the first reform but intended to break NTT up later. One of the main official reasons why the MPT opposed the divestiture and privatization before 1985 is that the divestiture would make NTTPC weak so that it could not provide universal and equitable services. NTT used the same argument against the divestiture. However, the MPT no longer views it as an important factor against the divestiture. The MPT raises monopoly power as the most important concern, so now the MPT supports divestiture even after NTT's announcement on its opening local loops.

I argue that the main reason why MPT was against the first reform is that the MPT was afraid to lose its authority. This view is also consistent with the fact that the MPT frowns on privatizing postal services and savings, which is no longer defensible on economic efficiency grounds. In fact, the MPT had been called the ministry for "outdoor service," and the Telecommunications Bureau had few experience to regulating private firms (only the Broadcasting Bureau had some experience).

Secondly, although the MPT had to follow the consensus for the first reform, the MPT legislated new laws: NTT Law defines NTT as a special company and TB Law includes the demand and supply adjustment clause. As mentioned above, these formal features of the current regime give the MPT an extraordinary degree of discretionary power, which is similar to other ministries.

Table 3. 5 Job Content of Amakudari from MPT*

Job Content	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Telecommunications and Information Services	0	1	1	3	9	7	7	9	6	6	5	6
Equipment for Telecommunications	4	3	2	5	6	5	1	1	3	1	4	2
Broadcasting	8	6	2	7	1	2	8	8	9	6	6	1
Postal Service	5	5	4	7	7	5	3	4	1	2	4	1
Savings and Insurance	1	1	1	1	0	4	3	0	0	0	0	0
Construction for MPT	3	2	2	1	4	3	1	2	0	2	1	0
Others	1	2	3	2	2	2	1	4	0	1	1	0
Total	22	20	15	26	29	28	24	28	19	18	21	10

Source: National Personnel Authority, *Eiri Kigyo e no shushoku ni kansuru nenji hokokusho (Annual report on private-sector employment personnel)*, Tokyo.

* Since only the firm's names amakudari will move is reported, this classification is made from the information.

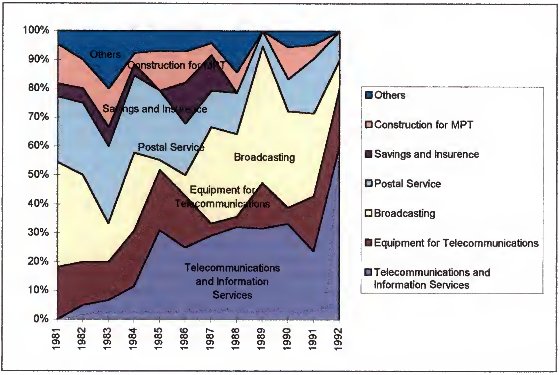

Figure 3. 8 Share of Amakudari from MPT Covering Different Sectors

Source: See Table 3.5

As noted above, the MPT succeeds in segmenting several sectors in the telecommunications industry, although the MPT recently announced that there is no administrative distinction among markets for NCCs. Thus, the MPT can regulate entry, price and service menu in each sector.

Table 3.5 shows the job contents of amakudari from the MPT, which is classifies and calculated from the National Personnel Authority data. Figure 3.6 depicts the share of amakudari covering different sectors. The number of the jobs in telecommunications and information service began to increase from the 1982 fiscal year. Recall that the third report was published in 1982. The ratio has been over 20% after the first reform, but it reached 60% in 1992. These observations suggest that the MPT finds and obtains rents in the telecommunications industry. Individuals driving from government agencies to private firms..

Third, breaking up NTT means not only an increase in the number of profitable firms but also a reduction in strong bargaining power against the MPT. Recall that originally most of specialists in the ministry began to operate NTTPC. The next chapter also shows that an increase in the number of firms increases the regulator's utility under some conditions.

This hypothesis is compatible with the final announcement of the MPT. If a holding company controls all of the companies in a market (as NTT would own shares of two regional companies), the ministry accepts this situation even it is illegal under current laws. In other words, the MPT is eager to obtain a greater number of profitable firms.

The MPT also announced that the MPT itself (rather than an independent authority) will play a central role on setting access charges for the two firms to obtain access into each other's network, and for other firms to obtain access for their services. This gives the MPT some regulatory control over competition and entrants even though entry regulation is abolished.

Furthermore, the MPT continues to treat the share-holding company and the regional companies as special companies: these companies are controlled under special laws the MPT will legislate. This situation contributes to an increase in the share of amakudari in telecommunications and information services. In other words, market competition will continue to be affected by an extraordinary degree of discretionary power.

In sum, the MPT could not obtain a consensus in the traditional way based on shingikai, but the MPT directly obtained NTT's agreement to the direction of the second reform. However, these procedures are unusual in the sense that a ministry has failed to obtain the consensus again and again. It suggests that the relative power of a Diet member as a mediator decreases. Thus, the MPT can pursue rents by neglecting other interest groups, which also suggests that its rents are so attractive. In this circumstance, NTT has to accept the announcement. Otherwise, the second reform will be postponed again, and it means that NTT may lose business chances in international and multimedia services.

3.4.2 Other Views and Problems of the Regime

The existence of rent-seeking behavior of powerful and discretionary authority yields different implications compared with those emerging from the analyses of the U.S. The recent deregulatory processes are outcomes of the political game associated with MPT's rent-seeking behavior. The economic environment develops, while the relative power of the bureaucracy increases. Thus, informal interventions remain, and market competition is limited. I can compare my observations with three views on Japan's telecommunications regime.

(1) Is the Japanese regime converging to the U.S. regime?

First, I evaluate the popular view that the Japanese regime is converging to the U.S. regime. Recall that the first reform in 1985 resulted in two main players: the MPT and NTT. Thus, it is often asserted that the situation corresponds to the FCC and AT&T before the 1984 divestiture. Furthermore, since the Telecommunications Council on "the second reform" repeatedly recommended splitting NTT into two local telephone companies, some observers conclude that Japan is struggling to follow the U.S. model, including mini-divestiture (similar to the AT&T breakup).[44]

Do these moves really imply that the two regulatory regimes are converging? The answer could be "yes" if we look for a tendency in the long run and consider a possibility to change political-incentive design. The two nations will utilize similar technologies (fiber-optic transmission and new radio technologies), and technology plays a significant role in economic-incentive design.[45] Even though regulatory officials in a country are hesitant to change incentive design, change occurs. Information on the different efficiency implications and differential performance among countries, and pressures created by international competition may promote the adoption of similar economic-incentive designs (and associated industry structures).

As TCP suggests, however, the Japanese telecommunications industry, as well as the U.S. industry, is path-dependent: the nation's organizations are different, and in particular, the political environment is likely to be sticky in particular in the short run. For example, even in the U.S. by the end of 1988, only 14 states had formally ended ROR of AT&T while the remaining states continued to apply it.[46] On the other hand, the MPT has never considered rate-of-return regulation in spite of the fact that the MPT legislates that rate setting should be based on ROR. These facts suggest that actual regulatory design can differ even though identical levels of technology are available. Thus, particularly in the short run, interest groups and institutional differences play central roles in influencing the evolution of regulatory practice.

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[44] For example, see *Wall Street Journal*, February 14 and March 1, 1996.

[45] At least in normative theory, technology is an essential element to design efficient regulation. Furthermore, many economists agree with that one of the main reasons for the recent deregulation wave across countries is technological change. For example, MacAvoy (1994, p.115) argues that change in regulatory practice towards telecommunications firms is a response to new technologies.

[46] Kaserman, Mayo and Pacey (1993,p.50). Their empirical results support the economic theory of regulation rather than the public interest theory.

Compared with the U.S. regime, the Japanese regulatory regime is generally different in the following ways.[47] (1) Since a Japanese ministry such as the MPT is a unique government agency that not only regulates the industry but also drafts legislation, the ministry is not a pure regulatory body like the FCC. (2) Since relational contracts are popular among Japanese players, jurisdictional disputes regarding regulation have almost never arisen in terms of public policy debates. (3) Since consumers lack a direct means to negotiate with the ministry, regulatory policy is likely to reflect supply side concerns. Thus, the differential transactions costs born by unorganized consumers and by knowledgeable suppliers influence the negotiations between the agency and key stake-holder groups. (4) The ministry is more powerful and discretionary, and a role of local authorities is negligible, in contrast with the U.S. where states have played significant roles in the development of regulatory policy. (5) Since the ministry can intervene (both explicitly and implicitly) in regulated firm's business, a regulated firm such as NTT is actually only a "quasi-private" firm. Its profitability depends crucially on government policy (rather than an market force).

For example, NTT is limited to offering domestic telecommunications services by the NTT Law: NTT in principle, unlike AT&T, cannot engage in manufacturing, information (content origination), and international telecommunications services.[48] However, NTT is actually operating in telecommunications markets in some foreign countries after the MPT (that drafted the law) interpreted domestic services in a "foreign" country as the "domestic" service under the law.[49] Furthermore, NTT already provides some information services, and the only clear barrier limiting NTT's affiliates and NCCs from CATV service is to obtain the MPT's permission.[50] However, these telephone companies have not entered CATV services yet, although some CATV companies have entered telecommunications services. There have been neither written rules nor court battles about whether NTT can engage in these information services. These observations suggest that implicit contracts between the MPT and regulated firms are dominate in Japan, which differs from U.S. situation. In the U.S., detailed FCC pronouncements and court battles characterize this stage of industry evolution.

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[47] The MPT is also more powerful and discretionary than the Office of Telecommunications (OFTEL) in Britain. Although both NTT and British Telecom (BT) were state-owned monopolies and privatized under the parliament systems, the OFTEL was established as an independent regulatory body in Britain while the MPT never recommended the establishment of another independent authority since that could reduce its own power. See Armstrong et al.(1994,Chapter 7), Kato ed.(1996,Chapter 4), and Obi (1996,Chapter 4).

[48] Since article 1 also stipulates that NTT may engage in business activities identical to domestic telecommunications business and other business activities necessary to achieve the purpose of the Company, there is plenty of room for interpretations in different ways. Koike (1990, p.36) concludes that it is by no means clear what NTT can and cannot do, just as the freedom of Bell Operating Companies (BOCs) after the AT&T's break up was not clearly defined; nor it is so clear after the historic Telecommunications Act in 1996.

Therefore, even if Japan had the same law as that in the U.S., the actual function of the regulatory agency would be different due to systematic institutional differences. The above mentioned observations from the popular press (that Japan is struggling to follow U.S. model) is are far too superficial to capture the Japanese regulatory regime because they neglect different features of political exchange among interest groups and the associated transactions costs.

(2) Does the centralized government promote the industry more efficiently?

Beyond the convergence hypothesis, there is a second issue to be addressed. In contrast with the view of "parallel evolution," Harris (1989) found that, due to the centralized power of the MPT, Japan could efficiently adopt policies that were better suited to promote rapid technological advance and insulate firms from global competition. He concludes that the US can learn important lessons from the Japanese experience: policy should be implemented primarily by a single agency like the MPT.

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[49] Kato ed. (1996, p.42). See also Obi (1996, pp.71-73).

[50] NTT has been providing certain information services as a videotex service and a kind of video-on-demand services for closed user groups, and also experimentally transmitted both Cable TV and Cable telephony. See Koike (1990,p.94,113) and Obi (1996,p.44,77).

Certainly, the Japanese regulatory regime may effectively promote the achievement of some clear economic goals. For example, NTTPC achieved two well-defined goals in the 1970's: no unfulfilled demand in 1977 and nationwide service by 1979.[51] Similarly, Singh (1995) suggests that the success of Singapore's telecommunications infrastructure, such as a completely digitized network, has been achieved by a single public firm under centralized direction and control. On the other hand, it is often said that U.S. policy making has been characterized as continuous conflicts among competing jurisdictions.[52] These facts suggest the possibility that centralized direction and control could more rapidly promote the achievement of simple and well-defined goals in some circumstances.

However, this argument supporting centralized policy direction neglects both the role of the developing economic endowment and possibility of abuse of discretionary power by regulatory officials. Since the new technologies and business strategies are close enough to commercial realization, the risks of changing past policies are now worth taking: it is likely that a variety of firms can build upon different technologies and skills to develop new services for the information age.[53] Thus, governments' guiding firms no longer seems to be efficient within a highly developed economic system, due to the uncertainties associated with new technological and commercial development. Under current circumstances, the efficiency implications of central planning are problematic, and the transaction costs of using the economic system are lower.

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[51] NTT Public Corporation required several five-year construction plan to meet these aims. See Nambu et al. (1989, p.153).

[52] Harris (1989, p.116). Sappington and Weisman (1996, p.54) also mention that competition in the U.S. telecommunications industry has been slowed by conflicting goals of state and federal regulators and by Congress. Furthermore, Faulhaber (1995, p.252,283) concludes that MFJ has become impediments to achieve potential social welfare benefits of the pending revolution in telecommunications.

[53] Faulhaber (1995, p.272-275). Sappington and Weisman (1996, p.7) also mention that the telecommunications industry is a fluid one where change is the only thing that seems certain: sophisticated new products and services are constantly introduced; many of these new services are being supplied with new technologies, often by new suppliers.

Furthermore, since the MPT is not only powerful but also discretionary, his analysis underscores a serious problem: the MPT is trying to exert the same discretionary power to seek its rents as the MOF and MITI did. However, no one can predict the optimal configuration of firms and services for the future, nor should one entity bear the risks associated with technological commercial uncertainties. Thus, the serious problem is that, there is no formal effective mechanism to restrict the powerful discretionary power within the current Japanese regulatory regime. Therefore, the conclusion by Faulhaber (1995, p.281) is also appropriate for Japan. Good answers to yesterday's problems are more likely to impede progress rather than help in promoting high industry performance.

(3) Does new economic incentive design increase welfare?

Third views is concerned with new economic-incentive design. For example, Sidak (1996) recommends six policy reforms following as (1) repeal all regulatory barriers to entry; (2) restructure the financing of universal service and carrier of last resort obligations so that social objectives are not founded through hidden rate subsidies; (3) allow NTT to rebalance local and trunk rates; (4) allocate as much radio spectrums as possible, it will expedite the development of wireless alternatives to the local loop; (5) Replace any remaining ROR with incentive regulation, if price regulation of any sort is still deemed to be necessary; (6) price network interconnection, resale of network facilities, and mandatory sale of unbundled service elements (if it is ordered) according to the "**efficient component-pricing rule (ECPR)**." These reforms seem to be more reasonable than the current regime from the economic point of view. As mentioned above, the MPT allowed NTT to rebalance its rate structure, and already announced on adopting incentive regulation, monitoring access charges and resale of network facilities.

However, the MPT is likely to adopt reforms in order to protect or promote its rents. In other words, without changing political-incentive design, the MPT does not adopt the reforms that decrease its regulatory control producing its rents (as repealing all regulatory barriers and price regulation). Even though it looks to adopt these reforms, the MPT legislates and implements them favoring for it at its discretionary. Recall that the MPT has never considered ROR seriously. Furthermore, as noted above, the MPT prefers controlling interconnection by itself to giving the right to a new independent authority.

Therefore, the basic problem of his argument is that his argument neglects political transaction costs in Japan. Even though his economic-incentive design seems reasonable, it is not politically feasible. It is not designed to motivate the MPT to adopt his reforms while the MPT is a dominant player in this decision making process.

Since the MPT officials are legislators and regulators, the existence of them is the toughest obstacle to reform and liberalize the current regime. Unlike the U.S, recall that the bureaucrat is employed for her life time. We cannot suppose that the dominant player decides to fire herself.

However, we may suppose a situation that relative power of politicians recovers: As noted above, most Japanese are tired of abuse of power by bureaucrats. As a principle, the current Administrative Reform Committee recommends repealing all of the entry. It gives some pressure to each ministry. If it is legislated, the ministry will lose the strongest credible threat. It implies that its informal power also decreases although we need more careful examination for its institutional complementarity.

In this case, how to set access charges is a key issue because it gives regulatory control over entrants and competition even though entry is not regulated directly. Recall that the interconnection issue is a key to understand recent deregulatory processes. Politically, the MPT condemned interconnection problems caused by NTT, and the MPT tried to use it to break up NTT. However, it turned NTT toward opening its local loops to NCCs to protect it from divestiture. Then, NTT even requested the MPT to build a new independent authority to monitor interconnection issues to promote deregulation. Thus, the MPT had to show some attempts promoting competition, which resulted in its deregulation package in December 1996. However, the MPT also announced controlling interconnection issues by itself.

Thus, access pricing is a central issue not only to increase social welfare from the economic point of view, but also to understand discretionary regulator's behavior. The ECPR recommended by Sidak is widely used but it neglects some transaction costs caused from uncertainty. I examine this issue in more detail from practical and theoretical aspects in chapter 5.

In sum, one can argue that the better the economic-incentive design is, the more difficult it is to implement in Japan. In order to solve this problem, some political-incentive design should be planned and enforced: the regulator's regulator must be created. Or abuse of power by the bureaucracy may recover relative power of the politicians through a change of social norms. I attempt to analyze political exchange between the powerful bureaucracy and business world in more detail in the next chapter.

3.5 Concluding Observations

I present the conceptual model for Japanese political exchange in which the Iron Triangle can be viewed as a nexus of informal relational contracts. Since a ministry uses shingikai in legislation and gyosei shido in implementation, it is a dominant player in the Japanese regulatory regime. However, this situation does not necessarily imply anticompetitive policies as long as power is constrained by the existence of horizontal competition among ministries as well as powerful habatsu or zoku politicians.

I also develop the conceptual model in the context of the telecommunications industry. The first reform (initiated by the cabinet) can be viewed as an outcome of Japanese political exchange based on informal relational contracts. While the laws provide formal features of the regime, informal intervention controls entry and price competition. This situation is similar to other industries regulated by the MOF, MITI and MOT.

However, the political game between the MPT and NTT toward the second reform is unusual in the sense that the reports by shingikai could not obtain a consensus among interest groups over several time periods. These processes are explained as outcomes of the MPT's unusual rent-seeking behavior, which is caused by the disappearance of powerful habatsu as well as recognition of new attractive rents.

The recognition of this powerful and discretionary authority shows some limitations of three views on Japan's telecommunications emerging from the literature on the U.S. The existence of the powerful and discretionary authority yields a serious problem: the better the economic-incentive design, the more difficult it is to implement. Abuse of power by the bureaucrat may result in an increase in relative power of politician through a decrease in the bureaucrat's prestige. Even it happens, how to set access charges remains as a key issue from both political and economic aspects because the discretionary regulator can use it for credible threat. The following two technical chapters present an analytical model of each issue.

CHAPTER 4
COMPLEMENTARY AND SUBSTITUTIVE LOBBYING ACTIVITY UNDER POWERFUL AUTHORITY: A POSITIVE AND NORMATIVE RATIONALE FOR AN INDUSTRIAL ASSOCIATION

4.1 Introduction

A variety of models for policy making have been developed in the fields of public choice, regulatory economics and related fields since the seminal work of Stigler (1971). Recently, Dixit (1996, pp.2-31) suggested a synthesis of normative and positive approaches to policy analysis, and viewed policy making as a process in real time: policy-making is constrained by a "feasible set," which takes transaction costs (which are more pervasive in politics than in markets) into account. His basic idea is that governments are imperfect systems (as are markets) because any political process should be viewed as a game between many participants (principals) who try to affect the actions of the immediate policy makers (agents). Therefore, some institutional differences may bring different patterns of policy making through different transactions costs.

I present a simple two-stage model which contains several characteristics of both "**complementary**" and "**substitutive**" lobbying activity under a regulatory body with an extraordinary degree of discretionary power. While complementary lobbying activity reflects competitive behavior of firms for their interests, substitutiva one reflects cooperative behavior. The existence of a discretionary regulatory body distinguishes my model from other models, and the situation may reflect several institutional features of the Japanese regulatory regime rather than U.S. regime: the regulatory body is also an effectively legislator since its rules can be equated to laws; the body frequently use "gyosei shido (informal administrative guidance)." These institutional features can be contrasted with the U.S. regulatory regime that some see as moving away from micromanagement of industries.[1]

The model is constructed on four institutional features of the regime: (1) a regulator (such as a Japanese ministry or bureau) has an extraordinary degree of discretionary power; (2) a politician (such as a zoku member) can be viewed as an mediator between the regulator and regulated firms; (3) the regulated firms form comprehensive and hierarchical network relationships (such as industrial associations and business organizations) by which they cooperatively negotiate with the regulator; (4) consumers play only a minor role in political exchange because they do not have a tight organization to negotiate with the regulator. Thus, I can focus on two main players: the ministry (or bureau) as a powerful and discretionary regulatory body; the regulated firms that take not only complementary but also substitutive lobbying behavior through the industrial association.

My particular concern is to show how a firm can determine its transactions costs or its lobbying activity when the regulator has an extraordinary degree of discretionary power. I present a simple two-stage model to do so, and derive the following results: (1) a substitutive lobbying firm can reduce its lobbying expenses more than those of a complementary or independent lobbying firm; (2) the substitutive lobbying firm's profit is always higher than the complementary one. (3) thus, the regulator's utility in the complementary case is always higher than that in the substitutive case; (4) her utility increases in the number of firms in both cases; (5) since the complementary equilibrium is likely to result in insufficient (or excessive) firm entry, a social planner can achieve the second best by controlling the regulator's rent extration; (6) on the other hand, the existence of substitutive lobbying activity automatically achieves the second best welfare that is higher than the complementary second-best welfare. Therefore, the model provides a positive and normative rationale for the existece of a cooperative network of firms under a discretionary regulatory body.

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[1] See Chapter 2 and 3 for features of the Japanese regulatory regime. see also Baron (1996) for an excellent summary and Wolferen (1989) for a number of examples. Spiller (1990) as well as Weingast and Moran (1983) suggest that Congress significantly controls the U.S. agencies.

The plan for the paper is as follows. Section 4.2 presents a simple two-stage model, and Section 4.3 characterizes both complementary and substitutive lobbying equilibria. Section 4.4 introduces a social planner for maximizing social welfare, and compares the second-best equilibrium with a regulatory equilibrium. Section 4.5 presents concluding observations and directions for future research.

4.2 The Model

There exist n regulated firms and a regulator that has an extraordinary degree of discretionary power to control them. In the first stage of a two-stage game, each firm chooses L_i, its own level of lobby activity, to maximize its net profits, π_i. This activity also can be viewed as some transactions costs to communicate and negotiate with the regulator who has discretionary power to assign goods to each firm by a_i.

At the second stage, the regulator chooses a_i to maximize her utility, U. We can view a_i as a quota or output assignment by the regulator. For simplicity, I assume that her utility consists of pure corporate taxes and that the pure-tax rate function (t_i, which I shall define later) is common knowledge among all of the players.

The formal problem for firm i at the first stage follows as

$$(4\text{-}1) \qquad \max_{L_i} \ \pi_i = (1-t_i)a_i - L_i \ \text{ for all } i.$$

As I shall show later, note that t_i is a function of not only lobbying activity by firm i but also that by other firms. Thus, this equation is basically similar to Becker (1983, p.377), although he assumes that a_i is given (and uses tax and subsidy respectively instead of t_i). In my model, L_i is a choice variable for each firm, and a_i is also a choice variable for the regulator. Since I set the reservation profits for each firm at zero, π_i should be nonnegative.

The problem for the regulator at the second stage is to choose a_i in order to maximize her utility U for given L_i (chosen at the first stage). I simply assume that U consists of the sum of pure corporate taxes collected from all firms, which is expressed as the sum of the product each assignment by a pure-tax rate for each firm, $t_i a_i$.

Notice that the pure-tax rate can be different among the firms because pure taxes may include hidden subsidies (like restrictions on entry) and hidden taxes (like inflation).[2] Since government's net revenue includes such informal taxes and subsidies, it does not necessarily balance (although it cannot be negative).

In other words, the regulator maximizes U for herself because she can dispose of the surplus at discretion. The existence of such discretionary power of the regulator distinguishes this model from the Becker model, in which the assumption of $U=0$ is always imposed. Thus, the formal problem for the regulator follows as

$$(4\text{-}2) \qquad \underset{a_1..a_n}{Max} \quad U = \sum_{i=1}^{n} t_i a_i$$

The pure-tax-rate function is critical to my model.[3] Although the regulator has discretionary power, social norms are supposed to require the regulator to induce the firms to supply more output. Thus, I assume that t_i is an decrease function with a_i, which follows as:

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[2] See Becker(1983, p.372).

[3] Thus, I implicitly assume that the sum of a_i is not greater than the total initial endowment prior to government distribution. If this assumption is not satisfied, we should add the constraint to equation (4-2).

(4-3) $t_i = b_i - \alpha a_i$ for all i,

where $b_i > 0$ and $\alpha > 0$.

As depicted in Figure 4.1, positive α implies that a larger firm pays such pure taxes at a relatively smaller ratio.[4] For example, "amakudari" may be a good example of such informal taxes unless amakudari bureaucrats do not bring more benefits to the firm than it costs to hire them.[5] In this case, positive α implies that the number of amakudari hired by a firm increases with an increase in a_i but the growth rate is diminishing.

I assume that the magnitude of the intercept of equation (4-3), b_I, depends on lobby activity of all the firms. This component corresponds to "influence functions" by Becker. He assumes that lobbying activity is a strategic complement, which reflects competition among firms for political influence. In other words, since a frim competes with another firm to obtain more output assinment, the reaction function is upward sloping. I call this activity or firm "complementary lobby activity" and a "complementary lobbying firm."

On the other hand, suppose that firms organize an industrial association and it coordinates lobbying activity of each firm for a certain purpose. Lobbying activity by one firm can be beneficial to other firms. Alternatively, the activity could be designed to other firms so that uncoordinated activity could escalate lobbying activity and cancel out the impacts of lobbying investiments.

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[4] Similarly, null or negative α implies that a larger firm pays pure tax at a flat rate, or relatively greater ratio. In these cases, however, we will not have interior solutions because equation (4-2) becomes convex in a_i.

[5] Amakudari are created when government officials leave the bureaucracy to assume related high-level posts in public corporations, industrial associations, and private industry with which they had worked closely during their government services. See chapter 3 and Okimoto (1989, p.161).

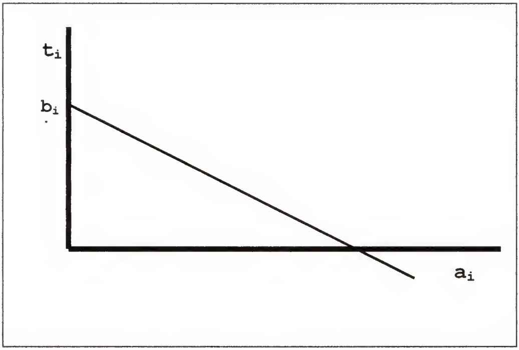

Figure 4. 1 Pure-tax-rate Function

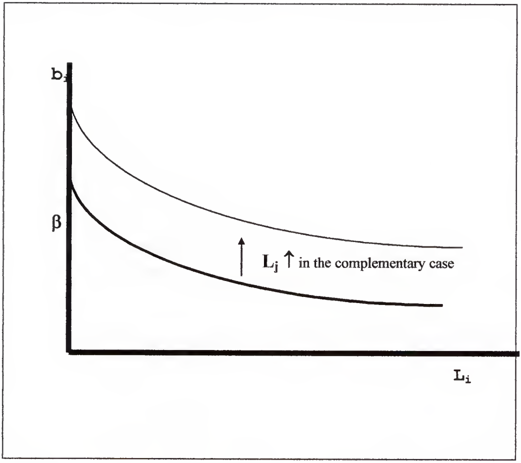

Figure 4. 2 Complementary Lobbying Activity

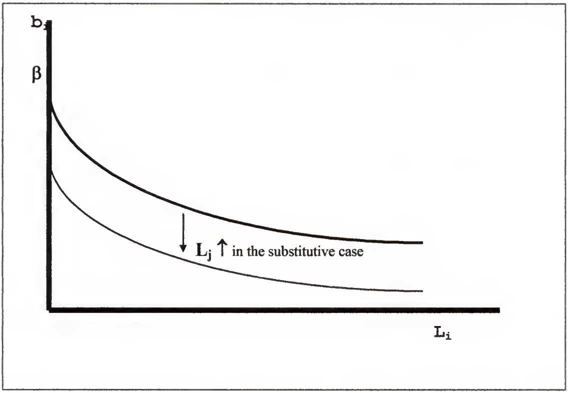

Figure 4. 3 Substitutive Lobbying Activity

It is well known that most of Japanese firms engage in hierarchical network relationships and cooperative behavior. I define a "substitutive case" in which lobby activity results in a strategic substitute. In other words, since a frim coordinates its lobbying activity each other, the reaction function is downward sloping. I compare this substitutive case with the "complementary" case reflecting political competition among firms.[6]

Formally, we can define b_i as

(4-4) $$b_i = \beta - [(L_i)^{\frac{1}{2}} + \gamma \sum_{j \neq i}^{n} (L_j)^{\frac{1}{2}}] \text{ for all } i,\ i \neq j$$

where $\beta > 0,\ -1 \leq \gamma \leq 1,\ n \geq 2.$

In sum, I define the "**complementary (lobbying) case**" as the equation with negative γ and the "**substitutive (lobbying) case**" for positive γ. If γ is zero, the equation can be viewed as an "**independent (lobbying) case**" or a single-firm case. While the difference among lobby levels is important in the complementary case because of competition among the firms for political influence, the sum of lobby levels is important in the substitutive case because of its public-good features or spill-over effects.[7]

Figure 4.2 depicts a complementary lobbying case when the lobby levels by other firms are given. If firm i invests in more lobbying activity, b_i decreases along the bold curve and so does t_i (unless a_i decreases more). However, since an increase in lobby activity by other firms shifts the curve upward, b_i increases and so does t_i (unless a_i increases more). Thus, an increase in L_i generally does not guarantee a decrease in b_i if other firms also increase L_j. By contrast with the complementary lobbying case, Figure 4.3 illustrates that b_i is lowered by lobbying activity of other firms in the substitutive case.

---

[6] If the average of investments by other firms is important, we can use another formula: $b_i = \beta - ((L_i)^{\frac{1}{2}} + \frac{\gamma}{n-1} \sum_{j \neq i}^{n} (L_j)^{\frac{1}{2}})$ for all i. In the complementary case, investing lobby does not have scale economis if $\gamma=1$. However, the formula yields a reduced form that is mathematically a special case of (4-4). See footnote 8.

[7] Notice this equation is similar to the model with impure public goods by Ihori (1992, p.387), in which he calls L_i an impure public good if $0 < \gamma < 1$.

Therefore, my task is to derive the sub-game perfect equilibrium in both the complementary and substitutive cases in this two-stage game. The next section derives and characterizes both equilibria.

4.3 Complementary and Substitutive Equilibria

The regulated firms decide their lobbying activities in equation (4-1) at the first stage, and then the regulator maximizes her utility based on equation (4-2) at the second stage. Thus, we can find the sub-perfect equilibrium by substituting the first order conditions for the regulator into the objective functions of the firms and by solving them.

As Figure 4.4 shows, the first order conditions for the regulator is to equate marginal revenue (or benefits) to marginal costs, which is similar to a maximization problem of a monopolist with zero marginal costs. This is formally written as

$$(4\text{-}5) \qquad a_i = \frac{b_i}{2\alpha} \text{ for all } i.$$

The assumption of $b_i>0$ guarantees the existence of positive a_i. The second order conditions do not depend on the pure-tax-rate functions, and they are always satisfied under my assumption, $\alpha>0$.

Now, we return to the first stage and substitute (4-5) into (4-1). Take the derivatives with respect to L_i, then we have the first order conditions for positive L_i:

(4-6) $$b_i = 4\alpha\sqrt{L_i} + 1 \text{ for all } i.$$

Notice that b_i must be greater than 1 for positive lobbying activity. Since the second order conditions are satisfied around the equilibrium, then we can confirm that complementary lobbying activity reflects strategic complementarity and substitutive lobbying activity results in strategic substitutite: a complementary lobbying firm invests in more lobbying and a substitutive lobbying firm in less lobbying when another firm increases the amount of its lobbying activity.

Since equation (4-6) holds for all the firms, there exist a set of symmetrical solutions: the amount of equilibrium lobbying activity of each firm is identical. Thus, by denoting $L=L_i$ for all i and by Substituting (4-4) into (4-6), we have the equilibrium lobbying activity.

(4-7) $$L = (\frac{\beta - 1}{A})^2,$$

where $A = 4\alpha + 1 + (n-1)\gamma$

Notice that the value of A depends on n in both complementary and substitutive cases but the value in the independent case does not.[8] Define $A_n = 4\alpha + 1 + (n-1)\gamma$, then the latter value can be expressed as $A_1=4\alpha+1$. If we think that the average of investments by other firms is important, lobbying activity does not depend on the number of firms: the value is A_2 in both the complementary and substitutive cases.

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[8] If the average of investments by other firms is important, we have $L = (\frac{\beta - 1}{4\alpha + (1+\gamma)})^2$. This can be seen as a special case of (3-7) when the number of firms is 2. See footnote 6.

In the substitutive or independent case, A is always positive and so is $(\beta-1)$. In the substitutive case, however, A decreases in n although A_2 is positive. Thus I assume that β is greater than 1 in all the cases.

Under this assumption, let superscripts **C**, **I**, and **S** denote the equilibrium values in the complementary, independent, and substitutive cases respectively. Then, we immediately have the following proposition and corollary for $n \geq 2$.

Proposition 4.1.

The amount of equilibrium lobbying activity for each firm has the following order:

$$L^C > L^I > L^S.$$

Proof.

For positive γ, $A > A_1$ for $n \geq 2$. For negative γ, $A < A_1$ for $n \geq 2$.■

Corollary 4.1.

(i) The amount of profits for each firm has the following order:

$$\pi^C < \pi^I < \pi^S.$$

(ii) Given the number of firms, the amount of utility for the regulator has the following order:

$$U^C > U^I > U^S.$$

Proof.

By the Proposition 4.1, equation (4-6) implies $b^C > b^I > b^S$. Substitute these into (4-1) and (4-2), then we have

(4-8) $$\pi^i = \frac{1}{4\alpha} - (4\alpha + 1)L^i \text{ for } i = C, I \text{ and } S,$$

(4-9) $$U^i = n\frac{(b^i)^2}{4\alpha} \text{ for } i = C, I \text{ and } S. \blacksquare$$

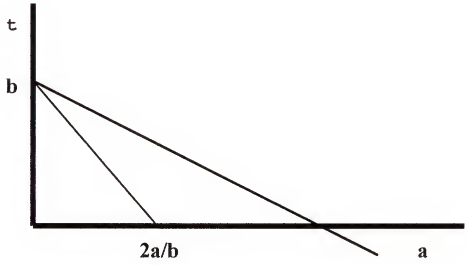

Figure 4. 4 Maximization Problem for Regulator

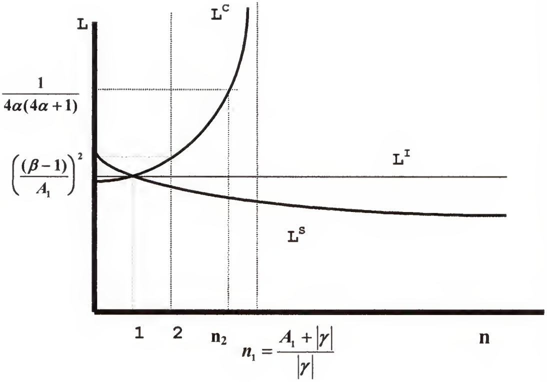

Figure 4. 5 Equilibrium Lobbying Activity

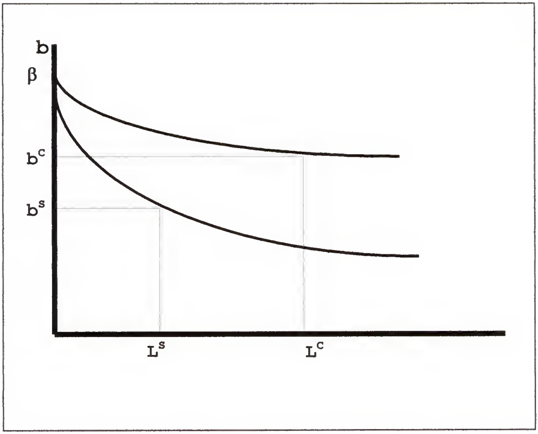

Figure 4. 6 Equilibrium Pure-Tax Rate

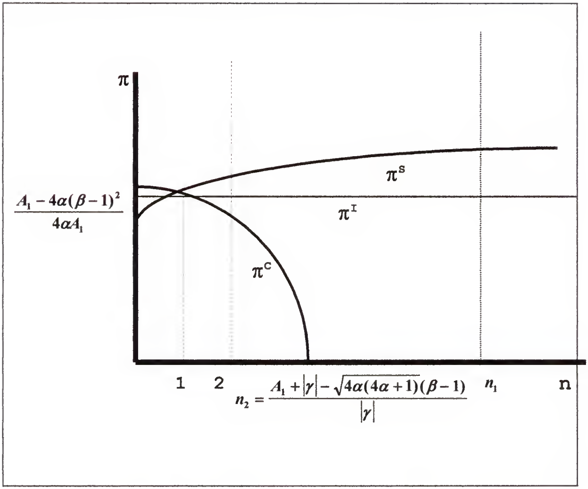

Figure 4. 7 Equilibrium Profits

Proposition 4.1 implies that a substitutive lobbying firm can make more profits by reducing the amount of its lobby expenses more than an independent or complementary one. As depicted in Figure 4.5, the number of firms in the complementary case is upper-bounded at the point (n_1) for $A=0$. Notice that the complementary lobbying firm faces a higher tax rate in spite of higher investment on lobbying. As depicted in Figure 4.6, the reason is simple: the investment is partially canceled out in the complementary case while it has spill-over effects in the substitutive case. Thus, we have the order of the intercepts such as $b^C>b^S$ in spite of $L^C>L^S$. Although the regulator assigns a firm more output when the intercept is higher, the maximization problem for the regulator results in $t=b/2$ as Figure 4.4 shows. Then, higher b implies higher t.

Corollary 4.1 implies that lower lobby expenses are beneficial to each firm but not to the regulator. As depicted in Figure 4.7, each firm always prefers substitutive lobbying activity unless lobbying costs are not substantial.

Notice again that the number of firms in the complementary case is upper-bounded at the point (n_2) for $\pi^C=0$.[9] Since an increase in the number of firms reduces the complementary lobbying firm's profits, a regulated monopoly hates new entrants unless cooperative behavior is available. Given the number of firms, the regulator always prefers the complementary case to the substitutive case because the complementary lobbying firm pays a higher tax rate and get greater output assignment.

4.4 The Number of Firms and Lobbying Activity

Since the regulator in my model maximizes her utility for herself, she is different from a social planner who is supposed to maximize a social surplus. Thus, I introduce such an idealized social planner into this model. I define the welfare index W by the sum of U and $n\pi$.[10] Notice that the social planner's achievement should be called "the second best" at most because he is constrained by this two-stage game. In this section, I assume that the regulator and social planner can control the number of firms, and compare these results.

---

[9] n_1 is on the right side of n_2. See Appendix A.2.

First, I can derive the regulator's utility curves by taking the derivatives of (4-9) with respect to n.[11] Figure 4.8 shows that the regulator can increase her utility by increasing the number of firms. In the substitutive or independent case, the number of firm increase infinitely as long as transaction costs to collect taxes is negligible. In the complementary case, however, it is bounded at the point, n_2 for $\pi^C=0$ because π^C decreases in n. Thus, we have Proposition 4.2.

Proposition 4.2.

Suppose that the regulator can control the number of firms and call the equilibrium a "**regulatory equilibrium.**" Denote each equilibrium number of firms in complementary and substitutive cases by N_R^C and N_R^S, then the eqilibilia are presented below.

(1) The complementary case: $N_R^C = n_2$,

(2) The substitutive and independent cases: $N_R^S = N_R^I = \infty$,

$$\text{where, } n_2 = \frac{4\alpha + 1 - |\gamma| - \sqrt{4\alpha(4\alpha+1)}(\beta - 1)}{|\gamma|} < n_1 = \frac{4\alpha + 1 - |\gamma|}{|\gamma|}.$$

Proof.

See Appendix A.3.

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[10] Thus it is "industry surplus" and it is different from social surplus in a usual mean: W includes the regulator's utility but not consumer surplus.

[11] See Appendix A.3.

Similarly, I can define a maximization problem to achieve the second best for the social planner:

(4-10) $$\underset{n}{Max} \quad W = (a - L)n.$$

It is easily shown that W is an increasing function in n in the substitutive and independent case.[12] Then, the social planner allows for infinite firms to entry this industry as the regulator does. In the complementary case, W has an single peak at n_3 on the left-hand side on n_1.

As depicted in Figure 4.9, however, whether n_2 is on the right-hand side of n_3 depends on the values of parameters: n_2 is on the left-hand side of n_3 if α is not small while n_2 can be on the right-hand side of n_3 if α and β are small enough. Thus, we have Proposition 4.3.

Proposition 4.3.

Suppose that the social planner can control the number of firms and call the equilibrium the "**second-best equilibrium.**" Denote each equilibrium number of firms in complementary and substitutive cases by N_S^C and N_S^S, then the eqilibilia are presented below.

(1) The complementary case: $N_S^C = n_3 < n_1$,

and $N_S^C > N_R^C$ if $h>0$, $N_R^C < N_R^C$ if $h<0$,

Where $h = 2\alpha(\beta-1)^2\{\sqrt{4\alpha(4\alpha+1)}(\beta-1)(2A_1+1) + 2(\sqrt{4\alpha(4\alpha+1)}-1)A_2\}$.

(2) The substitutive and independent cases: $N_S^S = N_S^I = N_R^S = N_R^I = \infty$.

Proof.

See Appendix A.4.

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[12] See Appendix A.4.

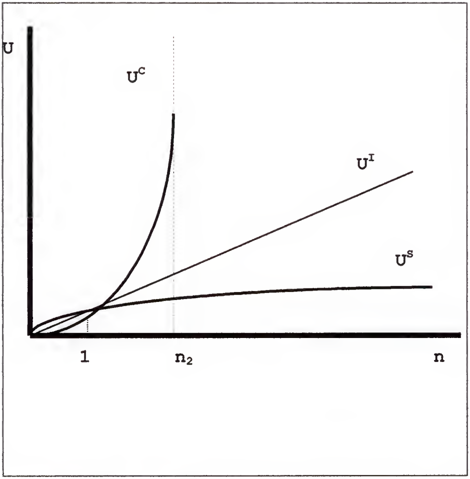

Figure 4. 8 Regulator's Utility Curves

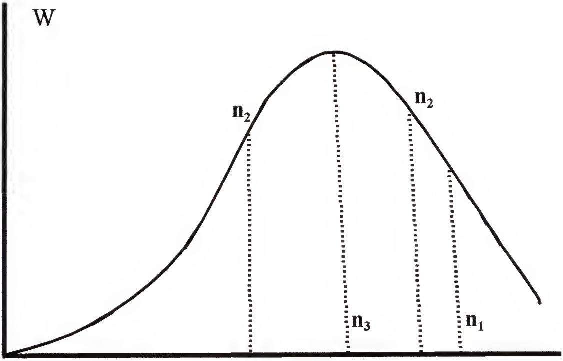

Figure 4. 9 Social Planner's Problem in the Complementary Case

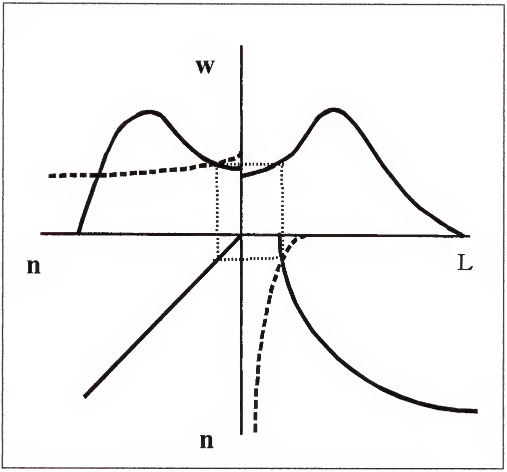

Figure 4. 10 Social Welfare Per n: $A_1 > \beta - 1$

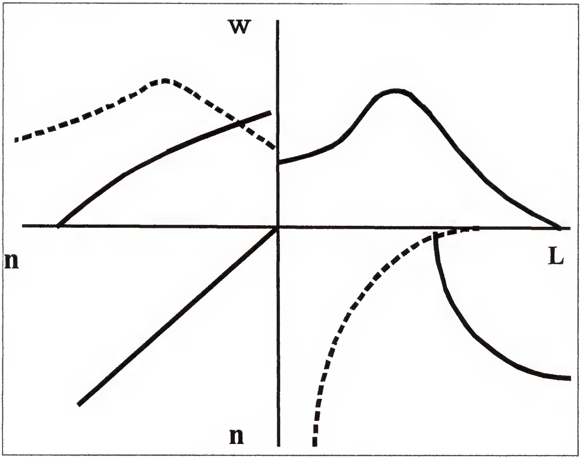

Figure 4. 11 The Social Welfare Per n: $A_1<\beta-1$

Therefore, the regulatory equilibrium in the complementary case results in too little entry if we have $4\alpha(4\alpha+1)\geq 1$. Generally, however, whether the complementary regulatory eqilibrium results in too little or much entry by firms depends on the values of parameters. On the other hand, the equilibrium in the substitutive case automatically brings the second best without the existence of the social planner. To illustrate why insufficient entry happens when α is not small, define W per n by $w=a-L$. Since $dW/dn=w+n(dw/dn)$, dW/dn is positive as long as dw/dn is positive.[13] As depicted by a bold line in the second quadrant in Figure 4.10, w in the complementary case has a peak with respect to n if $A_1>\beta-1$.

However, the regulatory equilibrium is the left-hand side on the peak if $4\alpha(4\alpha+1)\geq 1$. Then, the regulatory equilibrium results in too little entry. Given the number of firms, notice that w in the non-substitutive case can be higher in some interval than the value in the cooperated case if α is not so small. However, as depicted in Figure 4.11, this never happens if α is small enough for $A_1<\beta-1$. Since w in the substitutive case is always positive, W in the second-best substitutive equilibrium is always greater than the value in the second-best and regulatory complementary equilibrium.

Hence, the existence of substitutive behavior is better not only for the firm but also social or industry welfare. Furthermore, it also automatically achieves the second-best substitutive equilibrium whose welfare is higher than that of the complementary second-best equilibrium.

4.5 Conclusions

The existence of a powerful and discretionary regulator distinguishes my model from other models. Under the situation, I examine complementary and substitutive lobbying activity of firms, and I compare these results. While the regulator's utility increases in the number of firms in both cases, complementary lobbying firm's profits decrease and substitutive lobbying firm's profits increases in the number of firms. Thus, a firm has an incentive to engage in substitutive lobbying activity as long as its costs are negligible. This substitutive equilibrium achieves the second-best welfare while the complementary equilibrium is likely to result in too little or much entry: the former welfare is always higher than the latter.

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[13] An increase in α (or β) decreases n_2. See Appendix A.3 and A.5 for the details.

These situations reflect some of the features of the Japanese political economy, where the ministry and bureau have an extraordinary degree of discretionary regulatory power and most of firms participate in an industrial association. This analysis provides a rationale for such cooperative networks of firms under a powerful regulatory body, and it can be applied to analyze the outcome of the Japanese regulatory regime.

There exist some stylized facts of Japanese regulatory performance. It is well known that the number of firms regulated by powerful Japanese ministries has not decreased very much. For example, the number of banks regulated by the Ministry of Finance (MOF), which is the most powerful ministry in Japan, is almost the same as that in 1945. The recent controversy over the deregulation of telecommunications also reveals that the Ministry of Posts and Telecommunications (MPT) strongly prefers regulated oligopoly (or "managed competition") to regulated monopoly.

Since the model implies that the regulator prefers a larger number of firms as long as the transactions costs to manage them are negligible, it is natural for the MOF to protect banks from bankruptcy. It is also rational for the MPT not only to admit new entrants to the monopolized local-call service but also to divide the monopoly giant, Nippon Telegram and Telephone (NTT). Furthermore, it is also reasonable for NTT to be against the divestiture because NTT and new common carriers (NCCs) are not less likely to engage in cooperative behavior (resulting in substitutive lobbying activity): the model shows that the transformation from monopoly to complementary lobbying oligopoly harms the firm.

However, the model has limitted applicability for some regulatory regimes. The issues raised here suggest several directions for future work. In particular, by assuming that the total initial endowment prior to government distribution is large enough, I abstract from the production structure of firms relative to market size. Although the assumption may be appropriate for import industries where firms compete some quotas, we should incorporate some supply conditions (as well as demand conditions) into the model. By doing so, cost or technology differences of firms and asymmetric information between a regulator and firms could be analyzed.

CHAPTER 5
OPTIMAL ACCESS PRICING FOR AN OLIGOPOLY SEGMENT: ENTRY BY A LESS EFFICIENT FIRM ALWAYS INCREASES WELFARE

5.1 Introduction

This chapter is concerned with optimal access pricing in a setting where downstream competition is unregulated but imperfect, which I call **restricted regulation.**[1] In other words, a regulator does not control any price (except for access charges) in the down stream segment in restricted regulation. On the other hand, most of the literature on access pricing has been concerned with **partial regulation**, in which the regulator can control all of the prices of an incumbent firm (but not those of downstream entrants). If we assume one-dimensional cost uncertainty under **total regulation,** in which the regulator can control all of the prices including rival firms, the optimal policy will be similar to the Baron and Myerson (1982) (**BM model**). That policy could be the best option if there was no regulatory cost and no X inefficiency.

For convenience, I denote a vertically integrated monopoly and the rival firm by **firm 1** and **firm 2** respectively. Firm 1 monopolizes common network service in the upstream segment and provides network service for firm 2 as an essential input for any service in the downstream segment. In other words, there exist some entry barriers in both sectors. The access charge for the bottleneck as well as the rate for common network service are regulated. Note that the existence of entry barriers in the downstream segment does not necessarily mean the existence of government regulation because barriers may be caused from reputation effects or presubscription advantages of dominant firm 1.[2]

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[1] Vickers (1995), Lewis and Sappington (1995) examine access pricing under restricted regulation. This expression may not be in usage in incentive literature but it is very convenient for my purpose. For original usage, see Braeutingam (1979) and Berg and Tschirhart (1988, p.69).

A combination of a local-call market and a trunk-call market is a classic example. In Japan, three **new common carriers** (NCCs) skim cream in Japan's trunk-call segment, while **Nippon Telegraph and Telephone Corp.** (NTT) still provides over 90% of domestic calls. Since the first common network requires relatively large sunk costs, commitments to a new technology and long construction lead times, the firm that establishes the network (in a local-call segment) can exercise monopoly power in both segments. In order to limit monopoly power, regulation is generally recommended, unless alternative technologies (such as spectrum-band networks) are available.[3] The problem of access pricing is whether and how a regulator should set an access charge for common network service to maximize total welfare. Although the official regulatory regime in the Japanese telecommunications is total regulation, the factual regime is closer to restricted regulation: formal and informal entry barriers exist; rate-of-return regulation in downstream competition is just nominal; access charges have been set relatively lower than average costs.[4]

Furthermore, this setting may not only include several general features of regulated network industries but also reflect some essential features of unregulated industries. For example, as Armstrong et al. (1995) and Economides and White (1995) suggest, similar interconnection issues can arise in the antitrust context of an unregulated monopolist that is vertically integrated

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[2] See Sappington and Weisman (1996, p.245). Since the U.S. and New Zealand rapidly develop competition in telecommunications, the recent literature on interconnection charges develops its analysis in a "non-regulatory" context. See Armstrong (1996) and Laffont et al. (1996).

[3] Historically, a competitive environment has resulted from new technologies, and regulated firms often come to operate in such an environment. Laffont and Tirole (1993, p.247).also suggest that the deregulation wave since the 1970s has tried to facilitate a challenge of regulated firms by other firms using new technologies. However, the share of NTT local loops used for telephone services (including cellular phone and the Personal Handy Phone System (PHS) is over 99 %.

into a complementary upstream or downstream segment in which there exist a producer or potential entrant.

A widely discussed rule or principle for access pricing to essential facilities is the **"efficient component pricing rule (ECPR),"** which advises that optimal access charges be set equal to the sum of the direct (physical production) cost and opportunity cost of providing access.[5] The ECPR ensures that production will not be diverted to an inefficient producer: firm 2 is allowed to enter the downstream segment only if it is at least as efficient as firm 1.

The ECPR also has practical advantages for simplicity. It can be reduced to marginal-cost pricing under total regulation: both rates in the upstream and downstream segments are set at their marginal costs. Generally, deregulation in trunk service forces firm 1 to rebalance its rate structure, and then its price for common network service is likely to be closer to its marginal cost. Therefore, marginal-cost pricing or the ECPR may be attractive for poorly informed policy makers.

However, Armstrong and Doyle (1994) show that the ECPR is optimal only in a very special situation. As Laffont and Tirole (1994b, p.12) argue, this is a straight-forward result because standard perfectly contestable market theory assumes that all firms face identical cost functions and the same demand function. Furthermore, since standard perfectly contestable market theory abstracts from incentive issues, the ECPR is no longer optimal under asymmetric information even when identical cost and demand functions are assumed. In other words, an access pricing formula is very sensitive to how asymmetric information enters in the model.[6]

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[4] The MPT has been supposed to regulate trunk-call rates based on rate-of-return regulation but the tariffs have been almost the same instead of significantly different operations-revenue structures of carriers. See chapter 3 in more detail.

[5] The ECPR is also called the "Baumol-Willig rule," or "parity principle." See Willig (1979) and Baumol and Sidak (1994). See also Armstrong and Doyle (1994), Economides and White (1995) and Sappington and Weisman (1996) for illustrative examples.

[6] Private information may take a form of moral hazard as Laffont and Tirole (1986), unknown demand functions as Lewis and Sappington (1988a), countervailing incentives as Lewis and

It is now well established that the ECPR holds as a first-best pricing principle under the following conditions: (1) the downstream services are perfect substitutes; (2) the (actual or potential) rival firm has no market power; (3) all relevant technologies exhibit constant returns to scale; (4) the monopolist's production costs are known; (5) common network service is essential for producing downstream services.[7]

Recently, Lewis and Sappington (1995) examined optimal access pricing under restricted regulation with imperfect competition, where firms produce imperfect substitutes in the downstream segment and play a simultaneous price game while the regulator faces a budget constraint and asymmetric information on the rival's cost. They find that the regulator subsidizes the access charge to reduce equilibrium prices, and the incentive scheme is more favorable to a firm the more capable a competitor it is. In other words, the regulator may be able to structure access charges to improve social welfare under restricted regulation with imperfect competition. This result contrasts with having a common policy under total or partial regulation to "**level the playing field**" by supplying access on equal terms to all downstream producers.

Furthermore, in a simple setting under perfect information, Economides and White (1995) show several numerical examples of how allowing a less efficient firm to enter a monopolized segment may increase social welfare under marginal-cost pricing for access. Note that the existence of imperfect competition makes entry by an inefficient firm possible. Their logic is

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Sappington (1989a,b,c), the other correlated parameters or two-dimensional parameters as Caillaud (1990) or Lewis and Sappington (1988b). On the other hand, taking account of asymmetric information often makes the access pricing formula more complicated, as we shall show later.

[7] See Sappington (1996, p.245) and Economides and White (1995, p.3). These conditions are basically derived from optimal access pricing in total or partial regulation. For example, Armstrong and Doyle (1994) and Laffont and Tirole (1990) examine only this case. Note that optimal pricing based on asymmetrical information is also affected by firms' behavior patterns, cost and demand functions For example, Lewis and Sappington (1988a) show that asymmetric demand information does not produce any informational rent as long as marginal costs of production increase with output, while Biglaiser and Ma (1995) show that under asymmetric demand information the existence of an active rival always results in prices which are greater than marginal costs.

simple: the existence of an inefficient firm produces production inefficiency but reduces the dead weight loss by lowering prices. Thus, entry by even an inefficient firm could increase social welfare. According to their numerical examples, Bertrand competition is likely to increase social welfare more than Cournot competition because the latter results in higher prices and a substantial market share for the less efficient rival.[8]

Their examples suggest that the ECPR neglects an opportunity to increase welfare by allowing a less efficient firm to enter the monopolized segment, and the opportunity depends on demand and cost conditions. Finally, they conclude that entry by a less efficient firm may increase welfare.

Intuitively, this seems to be reasonable if firm 2 is not significantly inefficient. The reason is explained by a relationship between welfare and relative inefficiency. For example, Lahiri and Ono (1988) find a "U" shaped relationship between welfare and firms' share under Cournot competition. Recall firm's share in Cournot competition depends on its relative cost advantage: The higher the firm's cost is, the smaller the firm's share is. Thus, we may be able to imagine a "U" shaped relationship between welfare and cost differences (among firms). This supports the above argument: (1) Entry of a (slightly) less efficient firm may increase social welfare.

This insight also brings another conjectures when the cost difference is significant large: (2) Monopoly might be better than Cournot competition; (3) Raising access charges for a less efficient firm may increase social welfare. The first conjecture implies that the above argument by Economides and White (1995) does not hold if the inefficiency is significant. The second conjecture corresponds to the findings by Lahiri and Ono (1988): a marginal cost reduction in a firm with significantly low share decreases social welfare. In other words, social welfare may increase when a less efficient firm becomes less competitive, which corresponds to the optimal pricing rule derived by Lewis and Sappington (1995).

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[8] Notice that they criticize the ECPR by introducing some market power and applying marginal-cost pricing. Since this oligopoly setting is incompatible with one of necessary conditions to hold the ECPR, the ECPR or marginal-cost pricing is not optimal. If the regulator is perfectly informed, she shall not have to adopt such an "inefficient" rule as we shall show later.

Therefore, I examine a relationship between welfare and the relative inefficiency of firm 2 under marginal-cost pricing for access and the optimal access pricing design. To do so, I present the optimal design under restricted regulation with Cournot competition, which yields similar implications to Lewis and Sappington (1995). Then, I show that all of the above statements, (1), (2) and (3), are possible under marginal-cost pricing. This implies that marginal-cost pricing may reduce welfare if the regulator is not well informed, although marginal-cost pricing (as a special case of the ECPR) seems to be simple and practical for a poorly informed regulator. On the other hand, I find that only the first statement is possible under optimal access pricing, which implies that allowing a less efficient firm to enter a monopolized segment always increases social welfare. The main reason is that optimal access pricing contracts the feasible set of cost differences to more limited area. In other words, the optimal policy is not effective when the cost difference is significantly large under the given demand and cost conditions.

This chapter is organized as follows. First, I explain elements of the model, and then, I present the optimal access pricing design under asymmetric information. Third, I examine the above conjectures when the access charges are set at its marginal cost or the optimal access charges. Finally, I summarize my findings, and apply the implications to recent deregulatory processes in Japan.

5.2 Elements of the Model

The situation for access pricing examined in this chapter is as follows. Firm 1 produces q_0 units of local service for consumers (as common network service in the upstream segment), as well as q_1 units of trunk service in the downstream segment. A regulator controls the price (denoted by p_0) in the upwnstream segment. She also can control the access charge (denoted by

a) to make firm 2 possible to produces q_2 units of trunk service if firm 2 exists. Trunk service is assumed to be perfect substitute. Then both firms produce total trunk service output of Q $(= q_1 + q_2)$, and the corresponding price is denoted by P.

I introduce a simple linear demand system to make pricing formula tractable. Since trunk service is assumed to be a perfect substitute, consumers obtain utility $U_0(q_0)$ in the upstream segment and $U_1(Q)$ in the downstream segment.[9] I perform partial equilibrium analysis by assuming no income effects. The linear demand system with positive coefficients follows:

(5.1)
$$U_0 = \alpha_0 q_0 - \beta_0 q_0^2 / 2, \qquad p_0 = \alpha_0 - \beta_0 q_0,$$
$$U_1 = \alpha_1 Q - \beta_1 Q^2 / 2, \qquad P = \alpha_1 - \beta_1 Q$$

where $Q = q_1 + q_2$.

I also assume that both firms have identical requirements (one unit each) of common network service to produce their trunk service, which is a standard assumption in this field.[10] Thus, firm 1 produces $(q_0 + Q)$ units of common network service. Denote constant marginal costs in each segment by c_i, which expresses costs for producing q_i units of services for $i=0$, 1 and 2. Then, I define profits of both firms as follows:.

(5.2)
$$\Pi^1 = (p_0 - c_0)\, q_0 + (P - c_0 - c_1)\, q_1 + (a - c_0)\, q_2,$$

(5.3)
$$\Pi^2 = (P - a - c_2)\, q_2.$$

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[9] The assumption is convenient to trace effects of cost differences between firms. See Singh and Vives (1984, 547) and Vives (1985,p.169) for heterogeneous goods.

[10] Armstrong et al. (1995) allow a competitive fringe to get another access input and consider some substitution possibilities between inputs. Laffont and Tirole (1990, pp.49-52) consider imperfectly substitutive services and suggest that the regulated firm cannot claim high costs in order to hurt competitors without making a case against its service, using a fixed coefficient assumption and one-dimensional private information.

Notice that I abstract from fixed cost (K) incurred for common network services for simplicity. This does not affect my results as long as I can assume the existence of a transfer (T) to firm1 in this setting. Two firms are assumed to play simultaneous Cournot competition in the downstream market.

Now, I can define the welfare index by W, which is defined by the weighted sum of consumers' surplus (C) and firm 1's profit (Π^1) and firm 2's profit (Π^2):

(5.4) $$W \equiv C + w_1\Pi^1 + w_2\Pi^2 = S - k_1\Pi^1 - k_2\Pi^2,$$

(5.5) $$S = C + \Pi^1 + \Pi^2 = U_0(q_1) - c_0 q_0 + U_1(Q) - c_0 Q - c_1 q_1 - c_2 q_2,$$

where $w_i \in [0,1]$ and $k_i = 1 - w_i$ for $i = 1,2$.

Notice that maximizing W equals maximizing social surplus (S) if the weights are exactly the same as $w_1 = w_2 = 1$.

5.3 Optimal Access Pricing under Asymmetric Information

We have three players: firm 1 as a vertically integrated firm, firm 2 as the rival firm, and the regulator. The regulator always behaves as the Stackelberg leader who can commit herself to her regulatory policy. Then, both firms play simultaneous Cournot competition. I first describe this sequential game in order, and then present the regulator's formal problem.

First, each player realizes basic conditions on their demand and cost conditions, but only the regulator does not know the realized marginal cost to produce common network service, which is denoted by c_0. Then, she forms her beliefs about c_0, which are reflected in the differentiable density function of *f(c$_0$)*. The corresponding distribution function of *F(c$_0$)* is assumed to be such that *F/f* is an increasing function of *c$_0$* in strictly positive support on the interval $[\underline{c_0}, \overline{c_0}]$.

Based on her beliefs, the regulator offers a pricing menu to firm 1 in order to maximize the welfare index under the policy instrumets (p_0 and a). She knows that the minimum level profit of firms are zero, which is required to induce the firms to operate. She designs the menu so that the firm will set prices when the realized marginal cost is c_0. Thus, I presume the firm serves all demand at the regulated prices.

To state the regulator's problem formally, I appeal to the revelation principle. Let me define $\Pi^1(\hat{c}_0 \mid c_0)$ by profit that firm 1 earns if it reports that its cost parameter is $\hat{c}_0$. Thus, the regulator's formal problem **[RP]** to maximize expected welfare (EW) can be written as:

$$(5.6) \quad \underset{p_0,\ a}{Max} \quad EW = \int_{\underline{c_0}}^{\overline{c_o}} [S - k_1 \Pi^1 - k_2 \Pi^2] \ \ f(c_0) dc_o$$

subject to $\forall c_0 \in [\underline{c_0}, \overline{c_0}]$:

$$(5.7) \quad \Pi^1(c_o | c_o) \equiv (p_0 - c_0) q_0 + (P - c_0 - c_1) q_1 + (a - c_0) q_2 \geq 0 ,$$

$$(5.8) \quad \Pi^1(c_o | c_o) \geq \Pi^1(\hat{c}_o | c_o) .$$

The individual rationality constraints (5.7) guarantee the firm 1 the reservation profit (0), and the incentive compatibility constraints (5.8) induce firm 1 to report its cost truthfully. Notice that access pricing depends on $\hat{c}_0$. To make this point clear, denote with $\hat{\mathbf{x}}$ the variable that depends on $\hat{\mathbf{c}}_0$. Then, the incentive compatibility constraints can be written as:

$$\Pi^1(c_o | c_o) \geq \Pi^1(\hat{c}_o | c_o) \equiv (\hat{p}_0 - c_0) \hat{q}_0 + (\hat{P} - c_0 - c_1) \hat{q}_1 + (\hat{a} - c_0) \hat{q}_2 .$$

Since I assume the linear demand system, I can explicitly show that how each output in the downstream depends on the access charge. Simple calculation in the second stage game yields:

$$(5.9) \qquad q_i = \frac{\alpha_1 - 2v_i + v_j}{3\beta} \text{ for } i=1,\ 2 \text{ and } Q = \frac{2\alpha_1 - v_1 - v_2}{3\beta}.$$

where $v_1 = c_0 + c_1$ and $v_2 = a + c_2$.

Thus, an increase in the access charge increases q_1 but decreases q_2 more, and then decreases Q.

Then the necessary and sufficient conditions for the incentive-compatibility condition to hold (Guesnerie and Laffont (1984)) are as follows:

$$(5.10) \qquad \frac{d\Pi^1(\hat{c}_o | c_o)}{dc_0} = -q_0 - \frac{4}{3}q_1 - q_2 + \frac{a - c_0}{3\beta},$$

$$(5.11) \qquad \begin{aligned} \frac{\partial^2 \Pi^1(\hat{c}_o \mid c_o)}{\partial \hat{c}_0 \ \hat{c}_0} &= -\frac{\partial \ q_0}{\partial \hat{c}_0} - \left(\frac{4}{3}\frac{\partial \ q_1}{\partial \ a} + \frac{\partial \ q_2}{\partial \ a} - \frac{1}{3\beta}\right)\frac{d \ a}{d\hat{c}_0} \\ &= -\frac{\partial \ q_0}{\partial \hat{c}_0} + \frac{5}{9\beta}\frac{d \ a}{d\hat{c}_0} \geq 0 \end{aligned}.$$

Notice that I can get the first order condition (5.10) by using the envelop theorem, and the form is different from the simple BM model (which is $q_1 + q_2 + q_3$) by $\frac{\partial \Pi^1}{\partial q_2}$, which is positive when firm 2 is less efficient. Then, equation (5.11) holds if the regulator assigns higher prices in the upstream segment and higher access charges when firm 1 reports higher costs. This policy limits q_0 and Q. Generally, an increase in access charges raises the margin from its marginal cost but reduces Q. Thus, the optimal access pricing policy is recorded as proposition 5.1.

Proposition 5.1 The solution of [RP] has the following features.

(1) The optimal-tariff structure depends on F/f and k_i:

$$p_0 = c_0 + k_1 \frac{F}{f}, \tag{5.12}$$

$$a = \frac{1}{1+6k_2}[c_0(2+3k_2) - c_1(4-3k_2) + c_2(5-6k_2) - \alpha_1(1-3k_2) + 5k_1 \frac{F}{f}], \tag{5.13}$$

(2) The higher the weight on firm 1's profit (w_1), the lower the final prices and access charges are.

(3) Under the condition $w_2 > 1/6$, the less efficient firm 2 is, the less the regulator subsidizes its marginal cost of access

Proof.

Under the condition Q>0, equation (5.10) implies that the higher c_0 is, the lower Π^1 is. Then the individual-rationality and the incentive-compatibility conditions can be written as:

$$\begin{aligned}\Pi^1(c_0) &= \Pi^1(\bar{c}_0) + \int_{\bar{c}_0}^{c_0} [-q_0 - \frac{4}{3}q_1 - q_2 + \frac{a-c_0}{3\beta}]\mathrm{d}c_0 \\ &= \int_{c_0}^{\bar{c}_0} [q_0 + \frac{4}{3}q_1 + q_2 - \frac{a-c_0}{3\beta}]\mathrm{d}c_0 \geq \Pi^1(\bar{c}_0) = 0\end{aligned}$$

The objective function (5.6) follows as;

$$W = S - k_1 \frac{F}{f}(q_0 + \frac{4}{3}q_1 + q_2 - \frac{a - c_0}{3\beta}) - k_2 \Pi^2$$

Pointwise maximization yields (5.12) and (5.13). The coefficient of k_2 is positive from (5.9) ■

While pricing for common network service is as simple as the BM model, access pricing looks complicated. The reason is the low number of control variables for the regulator. I can easily show that the set of solutions will be the same as the BM model if the regulator controls only firm 1 under total regulation. However, in restricted regulation with imperfect competition, the regulator cannot directly control final prices. To illustrate this, we rewrite the above access pricing design in a symbolic form;

$$\begin{aligned}&(P - v_1 - k_1 \frac{F}{f})\frac{\partial q_1}{\partial a} + \frac{1}{3}(\frac{1}{\beta} - \frac{\partial q_1}{\partial a})k_1 \frac{F}{f} \\ &= (P - v_2' - k_1 \frac{F}{f})(-\frac{\partial q_2}{\partial a}) - k_2 q_2\end{aligned},$$

where $v_2' = c_o + c_2$.

The first terms in both sides suggest that the regulator is required to balance carefully the effects of a change of each output on social welfare. Then, marginal-cost pricing will be derived if we assume that the regulator can control each output and set each weight at 1 ($k_i = 0$). The second terms reflect direct effects of a change in access charges on each profit.

When the regulator sets higher w_1, she sets final prices and access charges at lower levels to induce more output. However, if she maximizes consumer surplus, the less efficient firm 2 is, the more the regulator subsidizes. If the regulator set the same weights on them as that on consumer surplus, the only distortion by imperfect competition remains. In this situation, the last feature in Proposition 5.1 becomes much clearer, which is recorded as the following corollary.

Corollary 5.1 If the regulator simply optimizes social welfare, the optimal access pricing design has the following features.

(1) The final prices and access charges are reduced to the following forms;

(5.14) $p_0 = c_0,$

(5.15) $a = 2c_0 + (5\mu - 4)c_1 - \alpha_1,$

(5.16) $P = c_0 + (2\mu - 1)c_1,$

where $\mu = c_2/c_1$,

(2) the less efficient firm 2 is, the less the regulator subsidizes its marginal cost of access.

Proof.

Equation (5.16) is immediately from equation (5.1) and (5.9). ■

Since the weights on profits are the same as that on consumer surplus, the existence of imperfect information is trivial. Thus, marginal-cost pricing holds in equation (5.14). However, the existence of imperfect competition yields (5.15), which reflects some correction for distortion by imperfect competition. The regulator optimally uses her limited instruments to subsidize firm 2: the less efficient firm 2 is, the less the regulator subsidizes its marginal cost of access. On the other hand, the access charge decreases when firm 1 reduces its marginal cost in either the upstream or downstream segment. Lewis and Sappington (1995) derive similar conditions in a restricted regime with Bertrand competition under unknown rival costs.

Proposition 5.1 shows that the regulator is required to change this principle when she considers only consumer surplus. Under the general welfare index, the regulator may subsidize a less efficient firm more because she cares consumer surplus more.

Compare this principle with mrginal-cost pricing for access. Equation (5.15) suggests that optimal access charges are generally different from the charges based on marginal-cost pricing. In other words, marginal-cost pricing is a special case in the following sense.

Corollary 5.2

(1) The optimal access charge in (5.15) will be equivalent with the access charge based on marginal-cost pricing only if the cost difference satisfies the following condition:

$$\mu = \frac{\alpha_1 - c_0}{5c_1} + \frac{4}{5}.$$

(2) This positive access charge does not exist if $\mu \geq \frac{\alpha_1}{5c_1} + \frac{4}{5}$.

Proof.

(5.9) and (5.15) yield a feasible set of μ that includes the above values: $1 < \mu < \frac{\alpha_1 - c_0}{4c_1} + \frac{3}{4}$. ■

Both access charges increase with an increase in c_0, but the slope of optimal access pricing is greater. Thus, they cross at only the one point even if the cost differences are not large. Otherwise, marginal-cost pricing results in a different level of access charges. I shall examine the differences of pricing access charges in more detail in the next section.

5.4 Cost Differences and Social Surplus

In a simple setting under perfect information, Economides and White (1995) show several numerical examples in which simple marginal-cost pricing for access may yield higher welfare than that of monopoly even when an entrant is less efficient. Lahiri and Ono (1988) also show that a marginal cost reduction in a firm with significantly low share decreases social welfare. Thus, social welfare may increase when a less efficient firm becomes less competitive. Since the firm's share depends on its relative cost advantage, its "significantly low share" is corresponds to "significant inefficiency" (as greater μ) in my model.

These arguments are summarized as the following statements: (1) entry by a less efficient firm may increase welfare; (2) monopoly might be better than Cournot competition; (3) raising marginal costs for a less efficient firm may increase social welfare under Cournot competition. Whether these statements are appropriate or not depend on what feasible "U" shaped relationships between social welfare and μ exist.

Thus, I examine a relationship between μ and social welfare (S rather than W) under perfect information with $p_0=c_0$. First, I compare social welfare under pure monopoly (denoted by S^M) with that under Cournot competition (S^E) when the regulator adopts marginal-cost pricing ($a=c_0$). Note that this is a special case of the ECPR under which the access charge is set at $a=(c_0+\alpha-c_1)/2$. Then, I also compare S^M with social surplus under Cournot competition (S^O) when the regulator adopts the optimal pricing design.

First, suppose that the regulator adopts marginal-cost pricing. This situation is corresponding to the setting by Economides and White (1995), and yields some relationships for social welfare.

Proposition 5.2 Marginal-cost pricing yields following results related to social welfare.

(1) $S^E>S^M$ if firm 2 is equally efficient ($\mu=1$).

(2) S^E takes a “U” form with respect to μ.

(3) $S^E > S^M$ holds when μ is small.

(4) $S^E < S^M$ holds when μ is large.

(5) However, $S^E > S^M$ never holds even when μ is extremely high.

Proof.

Since we have $Q = q_1 = \dfrac{\alpha_1 - v_1}{2\beta}$ or $P = \dfrac{\alpha_1 + v_1 + v_2}{3}$ under monopoly, the welfare index is as follows;

$$S^M = \frac{(\alpha_0 - c_0)^2}{2\beta_0} + \frac{3(\alpha_1 - v_1)^2}{8\beta}. \tag{5.17}$$

Using (5.9), we have the index in Cournot competition;

$$\begin{aligned} S^E = {} & \frac{(\alpha_0 - c_0)^2}{2\beta_0} + \frac{1}{18\beta}[11{c_1}^2\mu^2 - 2c_1\{7c_1 + 4(\alpha_1 - c_0)\mu \\ & + 8(\alpha_1 - c_0)^2 - 8(\alpha_1 - c_1) + 11{c_1}^2] \end{aligned} \tag{5.18}$$

Notice that (5.18) is reduced to (5.19) when $\mu=1$:

$$S^E = \frac{(\alpha_0 - c_0)^2}{2\beta_0} + \frac{4(\alpha_1 - v_1)^2}{9\beta} \tag{5.19}$$

Define the difference between (5.18) and (5.17) by $D^1 (= S^E - S^M)$,

$$D^1 = \frac{1}{72\beta}[4c_1\mu\{11c_1\mu - 2(4(\alpha_1 - c_o) + 7c_1)\} \\ + 5(\alpha_1 - c_o)^2 + 22(\alpha_1 - c_o)c_1 + 17c_1^{\ 2}] , \tag{5.20}$$

which has real roots (μ_1^1, μ_2^1) and the turning point (μ_0^1);

$$\mu_1^1 = \frac{5}{22}\frac{(\alpha_1 - c_0)}{c_1} + \frac{17}{22} < \mu_0^1 = \frac{4}{11}\frac{(\alpha_1 - c_0)}{c_1} + \frac{7}{11} < \mu_2^1 = \frac{1}{2}\frac{(\alpha_1 - c_0)}{c_1} + \frac{1}{2}. \tag{5.21}$$

However, we have $\mu = \mu_2^1$ from (5.9) when $q_2 = 0$. ■

Figure 5.1 illustrates this proposition. The upper figure summarizes proposition 5.2, and the lower figure shows the feasible set of μ. The set is depicted by the bold arrow and required for positive q_1 and q_2. It becomes large when α_1 is large or c_0 and c_1 are small. When μ takes a value at $\mu = \mu_2^1$, it yields $q_1 = 0$ because it is exactly the upper-bounded value of μ. In other words, only the left side on C is feasible.

On the left side on A, the statement by Economides and White (1995) is supported: S^E is higher than S^M even though firm 2 is less efficient. However, S^E is always lower than S^M on the right side on A. Entry by an significantly less efficient firm reduces welfare. On the interval between B and C, we can improve welfare by raising access charges, which corresponds to the findings by Lahiri and Ono (1988).

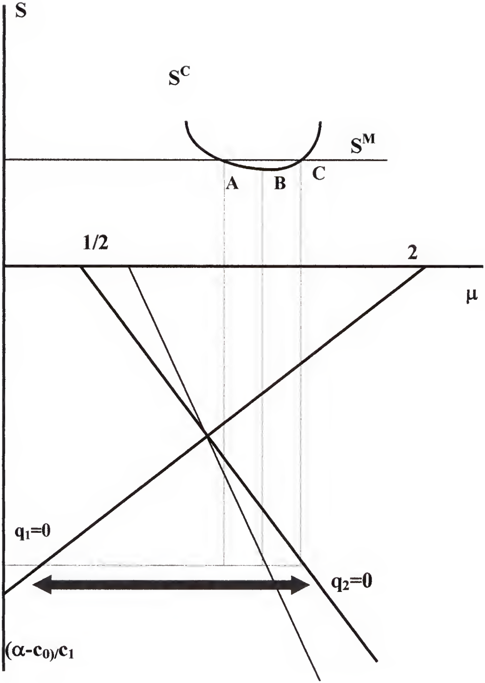

Figure 5. 1 Cost Differences snd Social Welfare: Marginal-cost Pricing

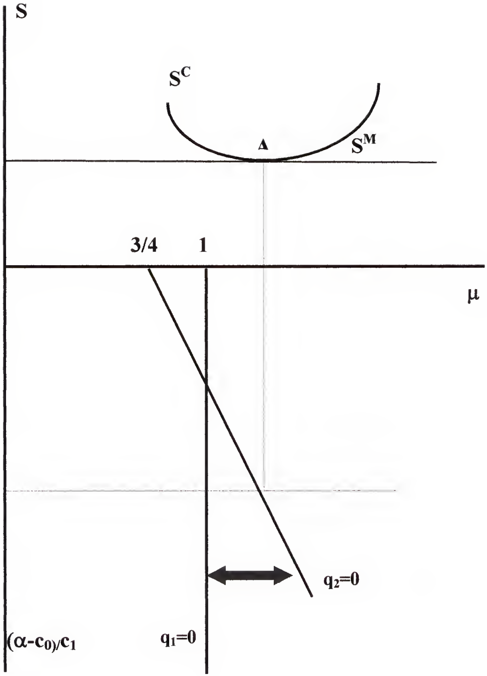

Figure 5. 2 Cost Differences snd Social Welfare: Optimal Access Pricing

Therefore, whether we should apply marginal-cost pricing to a oligopoly market under restricted regulation depends on the magnitude of the inefficiency of firm 2, as well as demand and cost conditions. Although it is said that the ECPR is simple and practical for a poorly informed regulator, but marginal-cost pricing as the special case may reduce welfare if the regulator does not know basic cost and demand conditions.

Next, suppose that the regulator adopts the optimal access design in (5.15). Similarly, denote the welfare index by S^O, and the difference between S^O and S^M by D^2, then we have Proposition 5.3.

Proposition 5.3 The optimal access pricing design yields the following features on welfare.

(1) Since S^0 takes a "U" shape with respect to μ, so $D^2(=S^o - S^M)$ does.

(2) Since the turning point of S^0 is the upper-bounded point for $q_2>0$, the upward sloping area is not feasible.

(3) D^2 is non-negative for $q_2>0$ so that we always have $S^0> S^M$.

Proof.

Substituting (5.14) and (5.9) into (5.5) yields S^o. Then, we have

$$D^2 = \frac{1}{8\beta}[c_1(4\mu-3)-(\alpha_1-c_0)], \tag{5.22}$$

which has only the one degenerate root at the turning point (μ_0^2);

$$\mu_0^2 = \frac{1}{4}\frac{(\alpha_1-c_0)}{c_1}+\frac{3}{4}. \tag{5.23}$$

which coincides with the upper-bounded condition for μ from (5.9), which is presented in Corollary 5.2. ■

As Figure 5.2 depicts Proposition 5.3, only the left side of point A is feasible for positive q_2. Thus, allowing a less efficient firm to enter a monopolized segment always increases social welfare. It is contrasted with marginal-cost pricing depicted in Figure 5.1 in which the intervals of the upward sloping curve is possible. In other words, unlike Lahiri and Ono (1988), it cannot happen under the optimal access charges that raising access charges for a less efficient firm increases social welfare. Nor is it possible that monopoly might be better than Cournot competition.

While the regulator under optimal access pricing has to take the inefficiency of firm 2 in to account, it is not cared in marginal-cost pricing under restricted regulation with imperfect competition. The regulator optimally uses her limited policy instruments to reduce the equilibrium price, and offers the optimal design by excluding an extraordinary less efficient firm, as well as a more efficient firm. It is illustrated the difference of the bold arrows in the both figures.

Therefore, optimal policy can (should) not be used for a significantly less efficient firm whose cost is higher than μ in (5.22). The magnitude depends on the demand and cost conditions again: the more the market is large and the more the incumbent firm is efficient, the more the inefficient entrants can be allowed. As long as the regulator uses this optimal access design appropriately, allowing a less efficient firm to enter a monopolized segment always increases social welfare.

5.5 Conclusions

I derive the optimal access pricing design under restricted regulation with imperfect competition, and then compare the welfare index with that of marginal-cost pricing. My main findings are as follows: (1) the less efficient firm 2 is, the less the regulator subsidizes its marginal cost of access under the non-weighted social welfare maximization problem; (2) the optimal access charge decreases when firm 1 reduces its marginal cost in either the upstream or downstream segment; (3) on the other hand, marginal-cost pricing does not depend on the downstream marginal cost (although the ECPR increases the access charge when firm 1 reduces its marginal cost in the downstream segment); (4) both access charges can be equivalent only if the certain cost and demand conditions are satisfied; (5) there exists a "U" shaped relationship between the cost differences and welfare under restricted regulation with Cournot competition, (6) then, under marginal-cost pricing, the following three scenarios are possible: entry by a slightly less efficient firm may increase social welfare; a monopolist might be better than Cournot competition; raising access charges for a less efficient firm may increase welfare; (7) however, under optimal access pricing, allowing a less efficient firm to enter a monopolized segment always increases social welfare; (8) the difference is caused by an informed regulator who sets optimal access charges to exclude such an extraordinary inefficient firm and to make final prices lower; (9) the more the market is large and the more the incumbent firm is efficient, the more the inefficient entrants can be allowed.

My findings (1) and (2) are similar to Lewis and Sappington (1995) while the observations (5) and (6) correspond to Lahiri and Ono (1988). In particular, the fact (6) explains not only the reason why Economides and White (1995) have the numerical examples in which monopoly might be better, but also a possibility that raising marginal costs for a less efficient firm may increase social welfare. However, the finding (7) suggests that optimal access pricing is designed to exclude this problem raised by Lahiri and Ono (1988). Under the optimal design, entry by a less efficient firm into a monopolized segment always increases social welfare.

Although we have to be careful to apply these theoretical findings to a real world, simple marginal-cost pricing under imperfect competition can increases social welfare when the entrants are not significantly inefficient. The Ministry of Posts and Telecommunications (MPT) has been tried to keep lower access charges. It yields cream skimming by NCCs and rate rebalancing by NTT. It may contribute to an increase in social welfare even though its behavior is based on a political reason rather than optimal pricing.

However, my analysis also suggests that a monopolist may be better if the rival's cost is significantly high. NCCs are less efficient than NTT under current demand and cost conditions, and a firm faces deficits instead of all firms facing almost the same final prices. Competition has been controlled through rate and entry regulations by the MPT. It may suggest some negative effects on welfare.

Therefore, we need to develop not only theoretical but also empirical research to make more precise evaluation. Theoretically, we may need to allow a rival firm to get another access input and consider some substitution possibilities between inputs, and also incorporate bypass or cream skimming into a model. Empirically, there are few work on the Japanese telecommunications industry because of data availability. Even social gain from the recent deregulation has not estimated yet. These issues await future research.

CHAPTER 6
CONCLUDING REMARKS

The dissertation has developed a framework to analyze a regulatory regime, political exchange between a regulatory body and firms, and a relationship between optimal access pricing and welfare. As a good laboratory for applying the transaction-cost economics and politics, I present a conceptual model in which "Japan Inc." is explained as a nexus of "informal relational contracts." I develop this model in the context of the telecommunications industry: recent deregulatory processes are explained as outcomes of the regulator's rent-seeking behavior constrained by informal relational contracts.

I also develop the conceptual model to analyze more specific situations rigorously. To do so, I identify essential institutional features, and incorporate them into analytical models. In this sense, the conceptual model and the analytical models are complementary.

Chapter 4 considers roles of a discretionary regulator and a cooperative group of firms as essential features of the Japanese regulatory regime. It presents a two-stage model for political exchange that contains both complementary and substitutive lobbying activity. The existence of the discretionary regulator distinguishes my model from other models in which an idealized social planner is assumed. Substitutive lobbying equilibrium profit of firms is always higher than the complementary lobbying profit. I also allow the number of firms to change, and find that the substitutive equilibrium automatically achieves the second best and brings higher welfare. Therefore, the existence of a network of firms has both positive and normative rationale under a powerful authority.

Recall one of the observations in chapter 3: the better the economic-incentive design is, the more difficult it is to implement. Under this circumstance, the coexistence of a powerful authority and a cooperative group of firms does not seem to change radically. It implies that several factual interventions by the ministries remain even though the formal regime looks to be deregulated.

Chapter 5 considers asymmetric information as common transaction costs across countries. I present the optimal access pricing design in a setting where a vertically integrated firm competes with a rival firm in a downstream segment. Restricted regulation with imperfect competition may reflect the basic features of the Japanese telecommunications industry. The derived basic principle under certain conditions is that the less efficient the rival firm is, the less the regulator subsidizes its marginal cost of access. I compare this principle with marginal-cost pricing for access. It is possible under marginal-cost pricing that a monopoly might be better than Cournot competition, and raising access charges for a less efficient firm may increase social welfare. However, optimal access pricing excludes these possibilities: entry by a less efficient firm to a monopolized segment always increases social welfare.

Even though that several factual interventions by the MPT remain, the deregulation wave will continue, and the formal regime will be closer to the U.S. regime. Then, how to set access charges is important because it gives the ministry some regulatory power even though it reduces other interventions.

As an institutional feature is pass-dependent, market performance is also pass-dependent. When worldwide competition is pervasive, how fast a firm can engage in business is crucial. However, the official regime does not allow NTT to operate worldwide business yet. Even though it officially can engage in it soon, it already loses some attractive business chances, which also determine future conditions for competition. In sum, since the ministry has strong incentives to seek rents but not to promote competition, it seems difficult to rapidly create a ubiquitous multimedia network (that lowers transaction costs) without changing political-incentive design. Ironically, the largest obstacle may exist in the political environment rather than in the economic environment. The Japanese problem may exist in the powerful bureaucracy (as a legislator and regulator) rather than private firms. In other words, Japan faces the serious problem to need the regulator's regulator.

Although these analyses should be complementary, we need to develop both conceptual and analytical models, as well as empirical research, to derive more precise evaluation. To do so, more parts of the conceptual model should be examined by both empirical research and formal analysis. We also have to develop analytical models to reflect essential institutional features in a systematic way. These issues await future research.

APPENDIX
EQUILIBRIUM ANALYSIS FOR LOBBYING ACTIVITY

A.1 The Second Order Conditions for the Sub-game Perfect Equilibrium

By using the symmetrical properties, we can derive the second order derivatives of π_i with respect to L_i and L_j:

$$\pi_i^{ii} = -\frac{4\alpha+1}{8\alpha L} < 0 \tag{A.1}$$

$$\pi_i^{ij} = -\frac{\gamma}{8\alpha L} \tag{A.2}$$

It is clear that a trivial case with $\gamma=0$ satisfies the second order conditions. Thus, we assume that γ is not zero. Then, π_i^{ij} is positive in the complementary case and negative in the substitutive case. Therefore, the reaction function for each firm in the complementary case is upward sloping and that in the substitutive case is downward sloping.

The Hessian determinant, H follows as

$$H = (\frac{-\gamma}{8\alpha L})^n \begin{vmatrix} (4\alpha+1)/\gamma & 1 & \cdots & 1 \\ 1 & (4\alpha+1)/\gamma & \cdots & 1 \\ \vdots & \vdots & \ddots & \vdots \\ 1 & 1 & \cdots & (4\alpha+1)/\gamma \end{vmatrix} = (\frac{-\gamma}{8\alpha L})^n (\frac{A}{\gamma})^n (\frac{A_0}{\gamma})^{n-1}$$

Since L, A and A_0 are positive by the assumptions, the second order conditions are satisfied for both negative and positive γ.

A.2 Upper-bounded Number of Firms in the Complementary Case

Define n_1 as the number of firms for A=0 and n_2 as the number of firms for π^N=0 respectively:

(A.3) $$n_1 = \frac{A_2}{|\gamma|},$$

(A.4) $$n_2 = \frac{A_2 - \sqrt{4\alpha(4\alpha+1)(\beta-1)}}{|\gamma|},$$

where $A_2 = 4\alpha + 1 - |\gamma| > 0$.

For the existence of the complementary equilibrium, $n_1 > n_2 \geq 2$ must hold. Then, the numerator in (A.4) must be greater than 2 |γ|.

A.3 Regulator's Utility Curves

Define $B_2 = 4\alpha\beta + 1 + \gamma$, then $B_2 > A_2 > 0$ because of β>1. Since the numerator in (A.4) must be positive, we also have $2A_2 - B_2 = A_2 - 4\alpha(\beta - 1) > 0$. Take the derivatives of (4-9) with respect to n, we have

(A.5) $$\frac{dU}{dn} = \frac{f(n)}{4\alpha A^3} > 0,$$

where $f(n) = \gamma^2 n^2 + (3A_2 - B_2)\gamma n + A_2 B_2 > 0$ for n>0.

The second derivatives follows as

(A.6) $$\frac{d^2U}{dn^2} = \frac{\gamma(A-B)}{2\alpha A^4} g(n),$$

where $g(n) = (3A_2 - 2B_2)\gamma n + 2A_2B_2$,

$B = 4\alpha\beta + 1 + n(1-\gamma) > A > 0$.

Thus, the sign of (A.6) depends on the values of parameters that is classified as Table A.1:

Table A.1 Sign of (A.6)

	$3A_2 \geq 2B_2$	**$3A_2 < 2B_2$**
$\gamma<0$	+,(-)	+
$\gamma>0$	-	-,+

Although there exist inflection points, the point in the complementary case is on the right side of n_1 that is defined in (A.3). Notice that $3A_2 \geq 2B_2$ implies that $|\gamma| \leq A_1 - 8\alpha(\beta-1)$ while $2A_2 \geq 2B_2$ implies that $|\gamma| \leq A_1 - 4\alpha(\beta-1)$. Thus, $3A_2 < 2B_2$ is possible only if β is great ($1.5 < \beta$) and α is great ($\alpha > 1/12$).

A.4 The Social Planner's Problem

Take the derivatives of (4-10) with respect to n, we have

(A.7) $$\frac{dW}{dn} = \frac{h(n)}{2\alpha A^3},$$

where $h(n) = \gamma^3 n^3 + 3A_2\gamma^2 n^2 + \gamma C n + D$,

$C = 3A_2^{\,2} + 4\alpha(\beta-1)A_2 + 2\alpha(\beta-1)^2 > 0$,

$D = A_2 E > 0$,

$E = A_2^{\,2} + 4\alpha(\beta-1)A_2 - 2\alpha(\beta-1)^2 > 0$,

(A.8) $$\frac{d^2W}{dn^2} = \frac{-2(\beta-1)}{A^4}k(n),$$

where $k(n) = \gamma^2(2A_2 + \beta - 1)n + 2\gamma A_2(A_2 - \beta + 1)$.

Thus, the sign of (A.8) depends on the values of parameters and it is classified as Table A.2:

Table A.2 Sign of (A.8)

	$A_2>\beta-1$	$A_2=\beta-1$	$A_2<\beta-1$
$\gamma<0$	+,-	-	-
$\gamma>0$	-	-	+,-

Since dh/dn has no real root, it is always negative (positive) for $\gamma<0$ ($\gamma>0$). Thus h is downward (upward) sloping for $\gamma<0$ ($\gamma>0$) with h(0)>0. Thus, W in the substitutive case is an increasing function of n. The value in the complementary case has a single peak at n_3 for $h(n_3)=0$: the point is located on the left-hand side of n_1 because $h(n_1)=-4\alpha(\beta-1)^2A_2<0$.

However, whether the point is located on the left-hand side of n_2 depends on the value of parameters:

(A.9) $$h(n_2) = 2\alpha(\beta-1)^2\{\sqrt{4\alpha(4\alpha+1)}(\beta-1)(2A_1+1) + 2(\sqrt{4\alpha(4\alpha+1)}-1)A_2\}$$

(A.9) is positive if α is great such that $4\alpha(4\alpha+1)\geq 1$ ($\alpha>0.15451$). Then, n_2 is on the left-hand side on n_3. It also implies $A/(\beta-1)\leq 1$ from $L^N\leq 1/\{4\alpha(4\alpha+1)\}$. If α and β are small enough, the value of h can be negative and A can be greater than (β-1). Then, n_2 is on the right-hand side of n_3.

A.5 W per n and Lobbying Activity

Define W per n by w, then w can be expressed as a function of L and takes the maximum at L=1:

(A.10) $$w = a - L = 2\sqrt{L} - L + \frac{1}{2\alpha},$$

(A.11) $$\frac{dw}{dl} = \frac{1}{\sqrt{L}}(1-\sqrt{L})$$

Since L is a function of n, both equations and the derivative of (A.11) with respect to n can be written as:

(A.12) $$w = \frac{p(n)}{2\alpha A^2},$$

where $p(n) = \gamma^3 n^2 + \{(A_2 + 2\alpha(\beta-1)\}n + E$,

$E = A_2{}^2 + 4\alpha(\beta-1)A_2 - 2\alpha(\beta-1)^2 > 0$,

(A.13) $$\frac{dw}{dn} = -\frac{2(\beta-1)}{A^3}q(n),$$

where $q(n) = \gamma[\gamma n - \{A_2 - (\beta-1)\}]$,

$$\text{(A.14)} \qquad \frac{d^2w}{dn^2} = -\frac{2(\beta-1)\gamma^2}{A^4}[2\gamma n - \{4A_2 - 3(\beta-1)\}].$$

(A.14) implies the second derivatives of w in the complementary (substitutive) case is negative (positive) when n is enough large. The sign of (A.13) depends on the values of parameters and it is classified as Table A.3:

Table A.3 Sign of (A.13)

	$A_2>\beta-1$	**$A_2=\beta-1$**	**$A_2<\beta-1$**
$\gamma<0$	-	-	+,-
$\gamma>0$	+,-	-	-

Thus, w in the complementary (substitutive) case has a single peak only if $A_2<\beta-1$ ($A_2>\beta-1$) holds: w has the maximum value of $(1+1/2\alpha)$ at the point of $n=\{A_2-(\beta-1)\}/\gamma$. Otherwise, w decreases in n: (A.12) and (A.14) suggest that the value in the complementary case can be negative but the value in the substitutive case is always positive.

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